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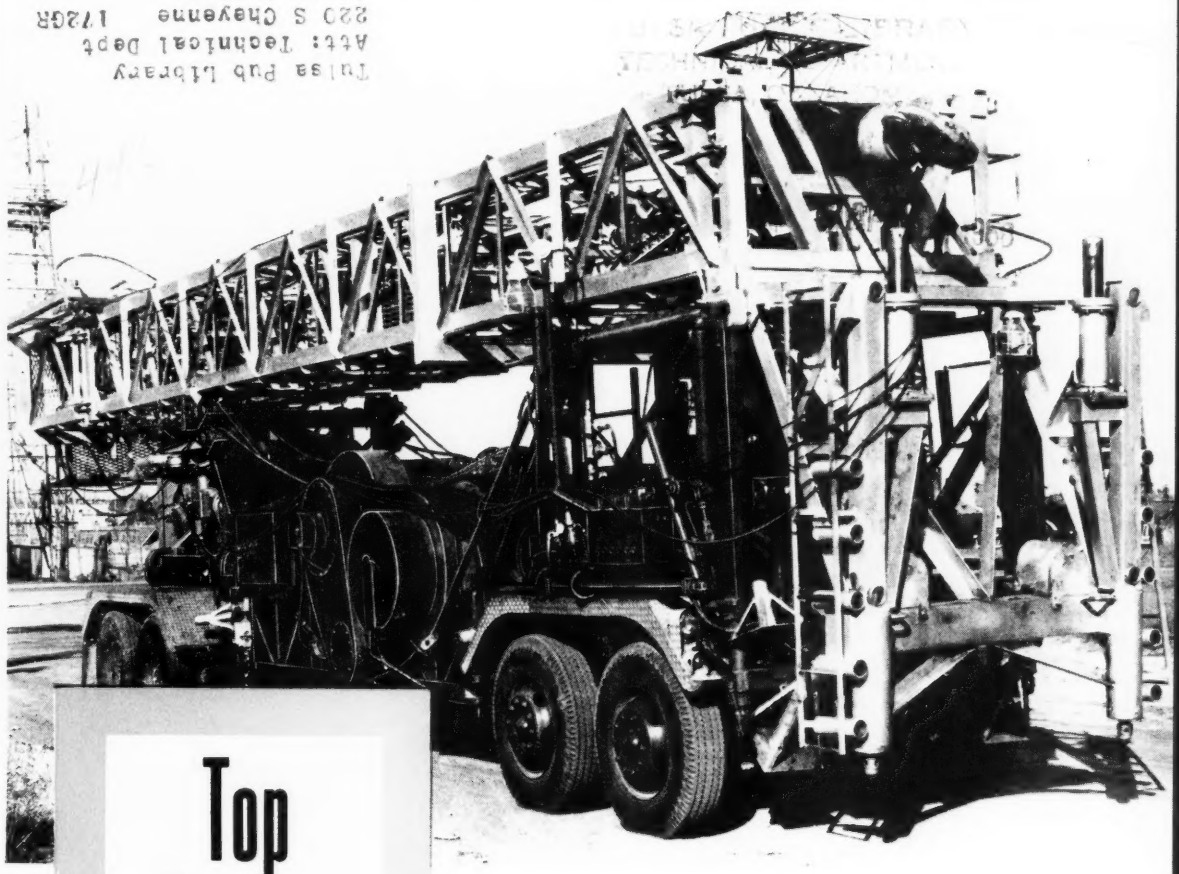

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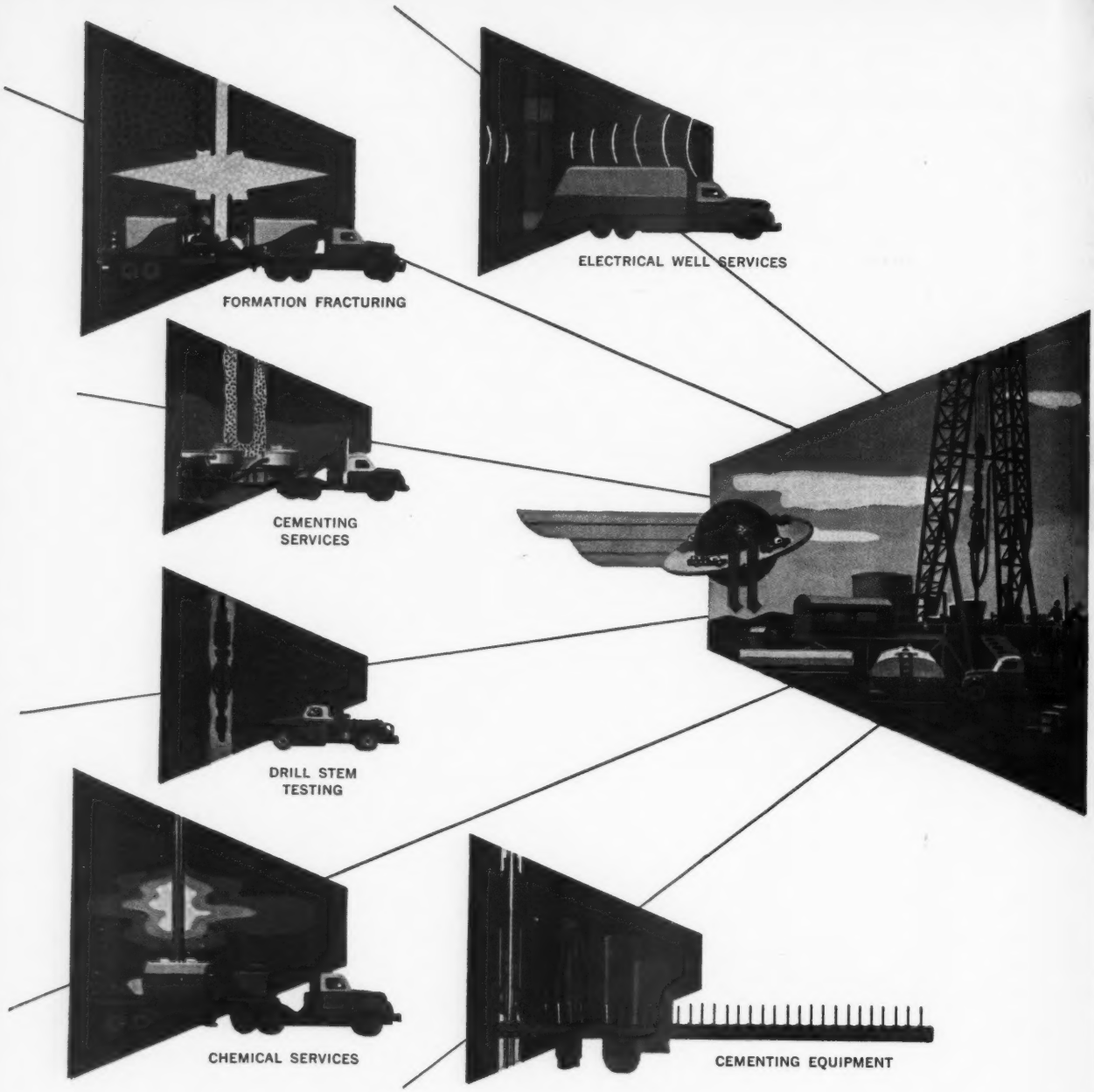

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Production Technology and Recoverable Oil Reserves

Abstract

This paper discusses the effect of technological developments on the recoverable reserves of petroleum, and will offer some opinions as to how processes now in the laboratory might affect future reserves. The following points will be developed:

1. Technological progress has led to a substantial increase in the amount of oil recoverable by modern producing methods.

2. Many important oil fields by current production practices will yield well over 50 percent of the oil originally in place.

3. There are still some areas in which legal, economic, or administrative problems discourage the use of the best production practice; and in these there is an opportunity, through improved production practice, to recover substantial quantities of additional oil.

4. Further developments in reservoir-engineering technology will lead to further refinement in conventional production practice and more widespread application of good practice which will add to the recoverable reserves of oil.

5. There are some types of fields, for example, those which produce heavy viscous oil and those where the oil is held in extraordinarily tight reservoir rock, where present-day production practices will not recover economically a large fraction of the oil in place.

6. The petroleum industry is actively engaged in research and development of new methods of recovering oil which should make it physically possible to recover a large fraction of the oil originally in place.

7. These new methods are expensive, and although it is unlikely that they can be applied profitably in all oil fields, they will find important commercial application in many areas.

Thomas V. Moore
Coordinator of Production Research, Esso Research and Engineering Co., New York

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Reservoir engineering is the art of developing and producing oil fields in such a way as to obtain a high economic recovery. Modern reservoir engineering had its beginning about 1930, when the practice of measuring gas and water production became common, when reliable instruments were developed for measuring pressure and temperatures in wells, when equipment became available for obtaining fluid samples under reservoir conditions, and when core barrels were manufactured which could take good samples of reservoir rock. It was further advanced by the introduction of modern instrumental well-logging systems. These tools, for the first time, furnished the engineer data on what was happening in oil wells; and permitted hypotheses of reservoir behavior to be tested in the field. These studies led to the exposition of the basic principles which govern the movement of oil and associated fluids through the reservoir rock and the well bore to the surface, and an understanding of these principles enabled engineers to devise means of controlling the energy of the oil reservoir in such a way as to improve recovery.

The technology of reservoir engineering developed along several lines. One of these was the conservation of the natural energy of the reservoir, brought about through more efficient and more economical well spacing, control of the rate of production from fields and wells, and elimination of the production of excessive quantities of gas and water. Another line along which progress was made was the mechanics of well completion and repair. Improved methods and materials went far to eliminate pipe failures and faulty cementing jobs, which had caused serious underground waste of oil. Methods of well completion, well repair, and workover were developed which made it possible to control better the movement of fluids in the reservoirs. New processes for well stimulation opened to production many reservoirs that otherwise would have been too tight to be produced at economic rates. Another field in which progress was made was in the development of processes for supplementing natural reservoir energy by injecting gas or water into the reservoir.

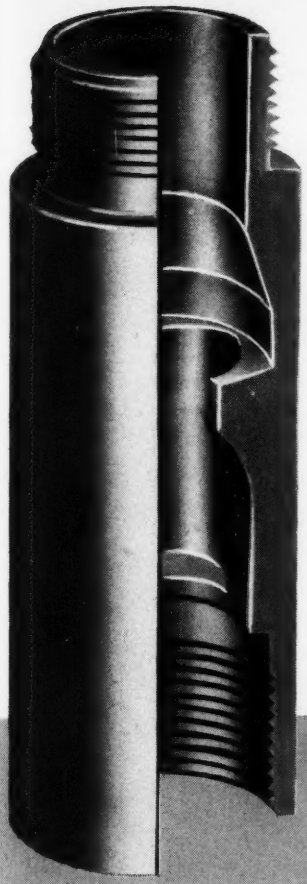
It would be interesting to have accurate, unequivocal figures on the

amount of oil that has been recovered through improvements in production technology, and on how much oil the present methods are leaving in the ground to be recovered by new techniques yet to be developed; but the data required for an accurate survey are not available. Hardwicke recently estimated[1] that modern producing methods, as practiced under the regulations of state conservation agencies, have resulted in an increase of 50 percent in the recoverable reserves. Although there may be room for some doubt as to the exact amount by which technology has increased the recovery of oil, there can be no doubt that the figure is very large, or that further improvements will lead to additional increases in the recoverable reserve. As new reserves become harder to find, interest in increasing the recovery from known oil fields has become keener, and some significant studies have been made as to how much oil present producing practices will leave in the ground. Fancher, in a recent survey[2] of the Texas fields, estimated that the fields of that state, which have produced about 14.8 billion barrels, have remaining reserves of about 26.2 billion barrels, 10.5 billion of which are to be produced by secondary recovery. This survey also indicates that this will leave 53.4 million barrels in the ground, which cannot be recovered by known methods. Fancher, in his report, defines secondary-recovery reserve as "the difference between the oil physically displaceable by fluid injection and the estimated primary reserve," pointing out that the definition does not consider economics. Tests on cores generally show that the oil physically displaceable is a much higher fraction of the original oil than Fancher's figures indicate; and suggest that a better definition of the secondary-recovery reserve would be the amount of oil, in excess of the estimated primary reserve, which would be recoverable under favorable economic conditions by the intensive application of the best-known recovery methods. Fancher's report suggests that the recovery for the State of Texas will average about 43 percent. Much of this oil was produced by wasteful practices, and much of the unrecovered oil lies in reservoirs of unfavorable characteristics, so that the oil recoverable by good modern production practice from good reservoirs must be far higher than the 43 percent indicated as the average past performance for this great producing area.

It is interesting to note many of the fields expected to yield a high percentage of the oil in place are those on which good data are available and which have been subject to good engineering analysis. Many of the fields in which the recovery is expected to be low are older fields for which good reservoir data are lacking. This may be one reason why Terry's compilation of estimates indicates a lower percentage of recoverable oil for the entire United States than Fancher does for Texas[3]. Torrey's figures show 272 billion barrels as the original oil content of known commercial reservoirs; whereas the sum of past production, primary and secondary reserves, is given as 105 billion barrels, leaving 167 billion barrels of oil unproducible by today's methods. Torrey and Fancher define secondary reserves in the same way, and it is believed that the same comment on the definition applies to both discussions. There is a chance of considerable error in any comprehensive survey of the nation's oil reserves, which would necessarily include so many fields on which good data are not available. A study of the performance of fields on which good data are available might give a better idea of how much oil is being left in the ground by good modern practice.

In view of the individualistic nature of oil reservoirs, it is not surprising that some old fields, produced without regard to conservation practices, have still yielded very high recoveries. Such fields were exceptional, and 25 years ago most oil was produced under methods which would yield a third, or less, of the oil in place. One example of an old field which yielded high recovery is Wortham. This was a narrow fault-line field producing from the Woodbine sand in East Texas. The relatively small oil reservoir was subjected to a powerful water drive from the large Woodbine aquifer with which it was connected, so that, in spite of close well spacing and rapid production, the water drive was effective and resulted in the displacement of a very large fraction of the oil. Recoveries from this area have been estimated at over 1,100 bbl. per acre foot[4]. Another example is the Oklahoma City field[5] which was developed and produced through its flush stage at a time when state conservation commissions were just beginning to exercise some control over petroleum production and before any effective control was possible in a field developed under such intensive competitive conditions as prevailed in Oklahoma City. Here the high recovery, estimated at over 60 percent of the oil in place, was due to reservoir conditions which were extraordinarily favorable for production of oil by gravity drainage.

Water drive and gravity drainage are two of the most efficient means for obtaining high recovery today, and a major contribution of modern reservoir engineering has been to show how these processes can be made effective in fields in which natural conditions were far less favorable than in Wortham or Oklahoma City. A recent example of good conservation practices is the operation at Elk Basin, where pressure maintenance by gas injection is estimated to be capable of recovering over 60 percent of the oil in place[6]. Had the recovery methods used at Oklahoma City been used at Elk Basin, the recovery might have been cut in half. Another example is the Kelly-Snyder area[7] where, even from an irregular reef reservoir, it is conservatively estimated that more than 50 percent of the oil in place will be recovered by modern producing methods made possible by unit operation. By the application of good reservoir engineering, recoveries of 60 to 80 percent are expected in many of the important fields recently developed in Western Canada. The East Texas Field, and many of the prolific fields of the Gulf Coast, may be cited as other examples of fields that will produce between 50 percent and 80 percent of the oil originally in place. Indeed, the majority of major fields in which the pressure has been maintained reasonably close to the original pressure, either through conservation of the natural reservoir energy or through injection of gas or water, have recovered over 50 percent of



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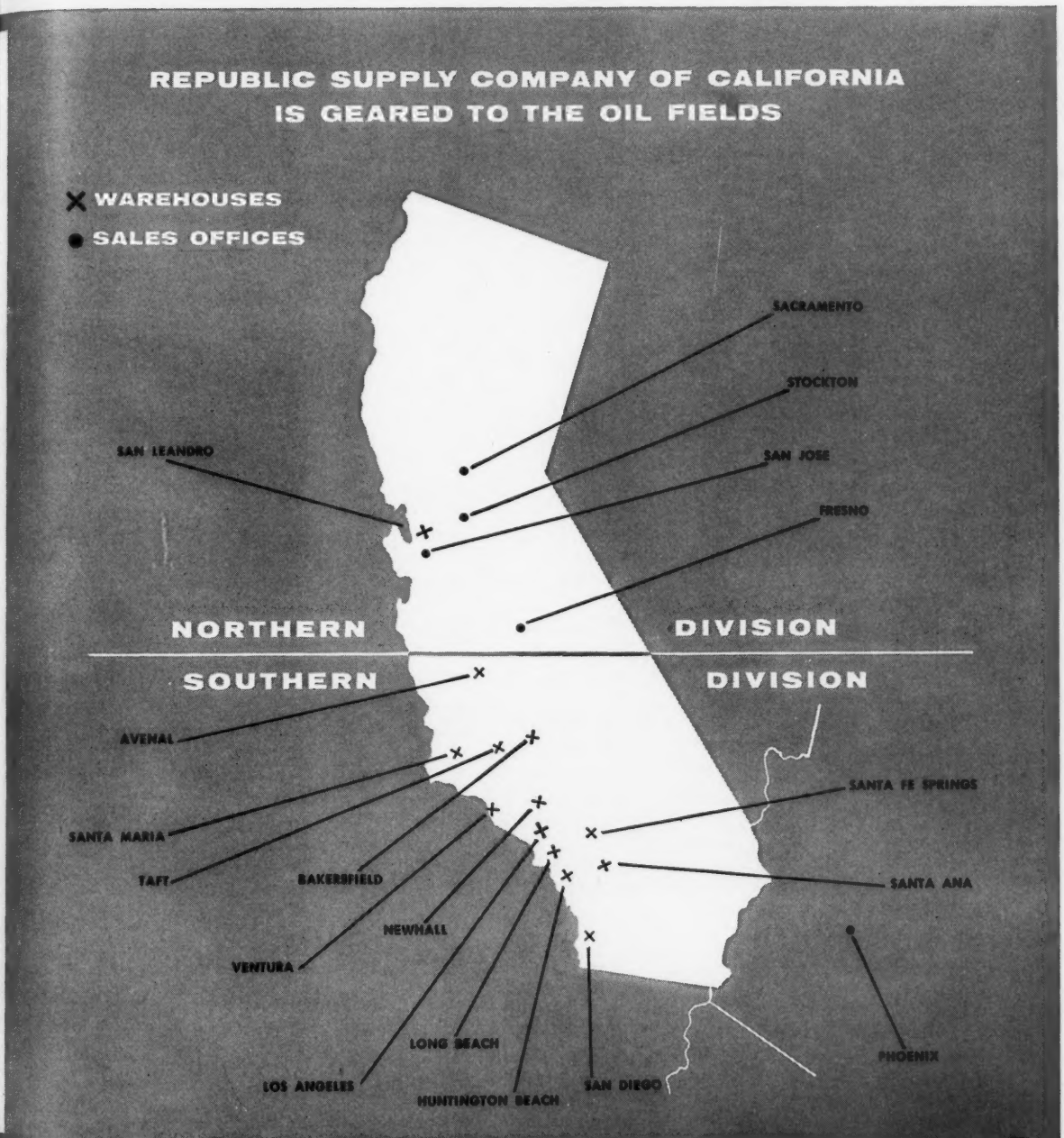

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their oil in place. Such recovery under efficient practice may be contrasted with the recovery of about 20 percent or 25 percent commonly expected from reservoirs depleted under dissolved-gas drive.

In fields that have been produced by inefficient primary-recovery methods, secondary-recovery operations can be used to obtain substantial additional production. Ultimate recovery by primary and secondary operations of 40 percent—60 percent is common under good secondary-recovery practice. Secondary recovery in depleted reservoirs is generally not as efficient as the equivalent fluid injection carried out as a pressure-maintenance operation in a new field, although there may be exceptions to this rule.

There are often practical considerations which dictate the use of less efficient mechanisms; there are still oil fields being depleted under the inefficient mechanism of dissolved-gas drive. One of the most common of these considerations is that the application of efficient reservoir-engineering methods generally requires unitization of the pool, or operation under conservation regulations that have substantially the same effect as unitization. In some oil fields in flush production it is virtually impossible to reconcile the interests of the various property owners so as to permit the adoption of a program for development and operation which would lead to maximum recovery from the whole field. When fields approach depletion under dissolved-gas drive, and it becomes apparent that the only way the production can be extended economically is through a secondary recovery under unitization, the property owners can often reach a satisfactory unitization agreement, but the arrangement of such agreements is sometimes extraordinarily difficult.

There may be good economic reasons for not adopting pressure-maintenance operations in the early life of some fields. In the case of smaller fields with reservoirs of poor quality, rapid production at the expense of high recovery may offer an acceptable payout on the investment in the properties, whereas pressure maintenance may result in too slow return of the capital tied up in the operation. Finally, there are, in many cases, technical reasons why pressure-maintenance operations are unattractive in some fields. Pressure maintenance requires a continuity of the producing zone and proper location of producing and injection wells. In smaller, less prolific and more irregular reservoirs, it is not always possible to ascertain the necessary continuity. In some areas the reservoir rock is so tight that it is not possible, under ordinary operating conditions, to drive the injected fluid through it. Then, there are many reservoirs in which the viscosity of the oil is so high that only a small percentage of it can be displaced by the flow of any reasonable quantity of gas or water through the rock.

The conclusion may be drawn from the foregoing discussion that oil recovery in some cases may be very high, possibly in the neighborhood of 80 percent in prolific fields produced under the best practice; or in others very low, in the neighborhood of 20 percent for those fields in which the qualities of the reservoir rock and oil are inherently unfavorable, or for those where economic conditions or other practical considerations discourage the use of best conservation practices.

The oil recovery, expressed as a percentage of that originally in place, is a convenient measure of efficiency; but in order to evaluate an operation properly, the amount of unrecovered oil must also be considered, as Muskat has done in a recent discussion of this problem[8]. One of the well-established principles of fluid flow through the reservoir rock is that oil must be present in a certain minimum concentration in order to flow at all[9]. This amount of oil is sometimes referred to as the residual saturation, sometimes as the equilibrium saturation. It represents the minimum amount of oil required to establish continuous flow channels to the well bore through which the oil may move. Quantitatively, it depends upon the properties of the reservoir rock and the contained fluids, but ordinarily it amounts to a few hundred barrels of oil per acre foot. This residual oil cannot be recovered by conventional techniques of primary and secondary recovery, which for the purpose of this paper are defined as those producing methods which do not involve substantial physical changes in the properties of the fluids in the reservoir. Thus, the unproduced reserve is classified into two parts: one, the oil over and above the residual oil, which is susceptible, physically if not economically, to recovery by conventional methods; and the other, the residual oil itself, which must be produced by a new recovery method if it is to be produced at all.

This point may be illustrated by some numerical examples (Table 1) for three hypothetical reservoirs whose assumed performance is fairly close to the actual results being obtained from some real fields.

Example "A" exemplifies some of the large prolific reservoirs of exceptionally good quality; example "B" is typical of a poorer quality of reservoir produced under pressure maintenance and careful reservoir control. Note that although the recovery from reservoir "B" was only one third that from reservoir "A", there was less unproduced oil in reservoir "B" than in reservoir "A". This is cited to show that percent recovery is often a poor index to the efficiency of a producing operation. Reservoir "C" is typical of

Table 1

	"A"	"B"	"C"
Porosity, percent	25	20	25
Connate water, percent	15	45	20
Residual-oil saturation, percent	15	20	15
Formation volume factor	1.20	1.30	1.10
Oil in place, stock-tank barrels per acre foot	1,375	660	1,410
Expected recovery, stock-tank barrels per acre foot	1,050	350	500
Unproduced oil, stock-tank barrels per acre foot	325	310	910
Residual oil, stock-tank barrels per acre foot	240	240	260
Limit on unproduced oil available by conventional means, stock-tank barrels per acre foot	85	70	650
Percent recovery	76	53	35

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some reservoirs depleted by dissolved-gas drive, in which case the reservoir would be a good prospect for secondary recovery. It also indicates what might be expected in some heavy-oil fields, in which case conventional secondary-recovery methods may not be applicable.

The question of how much oil is being left in the ground by modern methods might be re-examined in the light of the classification of unproduced oil into a component producible by conventional methods, and a component which will require a new technology to produce. This requires a detailed, field-by-field study for which adequate data are not available. However, a rough estimate might be made which is compatible with the data presented in Fancher's comprehensive study[10]. Oil present in all the known fields of Texas before exploitation is estimated at 94.4 billion barrels, of which about 45 percent will, according to Fancher, be producible by primary and secondary methods. Allowing for the fact that some oil was irretrievably lost by mechanical failures or by the wasteful production practices of the past, the amount of oil left, by present practice might be about half of that originally in the reservoir, leaving about half which might be exploited by improved technology. From laboratory data, it may be roughly estimated that the residual-oil saturation is about a quarter of the original oil in place, which, if it is to be recovered at all, will have to be obtained by some new process which involves more than simple fluid injection. This, therefore, would leave roughly another quarter of the original oil which might conceivably be attained by improvements in conventional methods.

Many of the larger and more important fields in the United States discovered since 1930 are probably leaving little more than the residual oil unproduced. Most of the oil which will not be produced under current practice is in older fields; in small, irregular fields; in the fields producing from inferior reservoir rocks; and in the fields producing viscous heavy oil. In some of these fields, the best modern practice is not followed, either through lack of economic incentive or because of the difficulty of carrying out a suitable unitization program. In others, the cost of getting and analyzing good reservoir data, and the high cost of some effective producing methods when applied on a small scale result in leaving some oil which is theoretically recoverable. Here, in these inefficiently operated fields, advancements in production technology will provide excellent opportunities to increase recovery, even by conventional methods. Some of the developments that are needed, which are the subject of active research in laboratories throughout the country are:

1. Better methods of determining the amount of oil in the reservoir, which may include better methods of coring and core analysis, improved well-logging instruments, and new methods of well testing and analyzing well-test data.

2. Better methods of predicting the effect of natural forces such as water drive and gravity drainage, which will come from better methods of analyzing reservoir performance.

3. Better methods of analyzing fluid-injection operations, which will develop from improved understanding of the effect of such factors as reservoir irregularities, injection rate, injection-well patterns, and sections most suitable for injection and production.

4. Better methods of determining the configuration of the reservoir, perhaps from well-test data, possibly by geophysical methods, which would permit wells to be located properly with respect to the structure, and would result in more efficient patterns of fluid flow in the reservoir.

5. Better methods for well completion, well repair, and well stimulation, which will provide the necessary mechanical tools for reservoir control.

Developments such as these will not only extend the usefulness of present production methods so that the economic recovery may more closely approach the limit set by the laws of fluid mechanics, but they will be equally useful to the engineer in his attempt to meet the challenge which he now faces, that of capturing the remaining oil not available through conventional methods.

To get at the residual oil, it is necessary to bring about significant physical changes in the reservoir fluids other than those which occur during normal depletion. Several promising approaches have been demonstrated in the laboratory and are now being tested in the field.

It has been shown in the laboratory that some of the residual oil can be produced through the reduction of the interfacial tension between oil and water by surface-active agents[11]. Many field tests of this method have been made, but the results so far have not conclusively demonstrated the economic advantages of the process[12].

The use of solvents in various ways is also being seriously studied[13], and laboratory tests show that almost complete recovery is theoretically obtainable. Several methods of applying solvents in the field are being tested. One of these, using LPG components to enrich injected gas, has given results which suggest that under favorable conditions recoveries of the order of 80 percent might be obtained in practice[14]. The possibility of using nonhydrocarbon solvents such as carbon dioxide is being studied[15]. Vaporization of a part of the residual oil by gas injection at high pressure has been proposed[16], and is now being tested in the field[17]. One of the most interesting techniques recently proposed is the recovery of oil by condensing gas drive[18].

Several thermal methods of increasing recovery are being investigated, one of the most interesting variations being in situ combustion[19], [20]. Small field tests have been run on this method, and recently plans for tests of considerable significance have been announced by General Petroleum Corporation[21], and Standard Oil Co. of California[22].

Laboratory tests and theoretical studies have demonstrated that any of these new recovery methods are capable of removing almost all of the oil from the rock through which they are operative. Only two barriers keep them from being widely used today. One of these is the physical problem of controlling the fluid distribution in the reservoir in such a way as to operate throughout the productive section of highly complex and irregular reservoirs.

To learn something about this problem is one of the objects of the field tests now under way. The other is the problem of economics. It is not surprising that each of the new methods proposed requires expenditures of considerable size, whether they be for chemicals, for carrying a large inventory of solvents, for fixed charges and operating costs of large compressor plants, or for fuel. The new methods are expensive, and they must compete with conventional producing methods.

The worth of a new method is measured not by the average cost of production, but by the increment cost of the additional oil produced. Inasmuch as a large part of the original store of oil in the ground can be produced at moderate cost by conventional methods, a new method must pay for itself by operating on reservoir rock which is lean in oil. Furthermore, the new method must produce a significant physical change in the properties of the reservoir fluids, which is an expensive burden not carried by conventional methods. These conditions impose an economic handicap which is very difficult for any any new method to overcome.

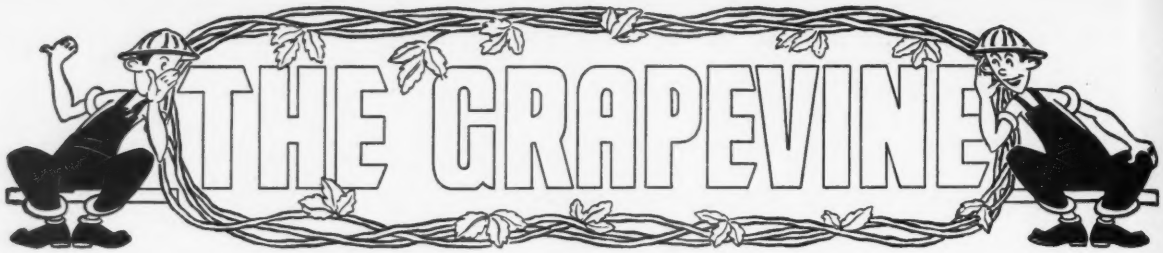
For these reasons, the new recovery methods, as presently conceived, are unlikely to be applied universally. On the other hand, there undoubtedly will be fields where circumstances will permit the new methods to be used economically to obtain very high yields of oil. One type of field which probably can be economically produced by thermal methods or by solvents is that with heavy, viscous oil where water injection leaves a substantial amount of oil unproduced. Another case where a new method might be advantageously employed is that of a field located in an area where substantial quantities of LPG are available at low cost. Certain features of the new methods will gradually be incorporated into conventional practice to develop a technology which will give far greater yields of oil than present methods do, but which may fall short of the ideal of recovering 100 percent of the oil in the reservoir.

Undoubtedly, a larger percentage of the oil would be economically recoverable if the United States were dependent for its liquid fuel upon the residual oil in known commercial reservoirs. This is not the case. The geologists have shown a remarkable ability to discover new reserves of oil. As production technology improves, fields of poorer quality and in less favorable areas can be exploited. And finally, there are the oil shales and other non-petroleum sources of liquid fuel which can be made available at a cost which, although it is higher than the cost of petroleum fuels, would not be an excessive burden to the country's economy.

To summarize, technological developments over the past 25 years have led to improved production practices which are capable of capturing a far higher percentage of the oil originally in place than former methods. At the present time, about half the original oil is being recovered, but rapid technical progress is being made, and even greater recovery is to be expected in the future. Radically new methods are being developed which will add to the recoverable reserve in many fields, but continual improvement along conventional lines may play an even more important part in producing oil reserves that are being left behind today. Although it is probable that methods could be devised to recover practically all the oil in a reservoir, economic considerations make it unlikely that such methods will be widely practiced in the foreseeable future.

REFERENCES

1. Hardwicke: Adequacy of Our Miner Fuels, **Annals Am. Academy Political Science,** 281.55, May (1952).
2. Fancher, Whiting, and Gretsinger: The Oil Resources of Texas, **Texas Petroleum Research Committee** (1954).
3. The Petroleum Resources of the United States, **Producers Monthly,** Vol. 19, No. 9, 41, July (1955).
4. Hill and Guthrie: Analysis of Oil Production in the Near-depleted Mexia-Powell Fault-line Fields of Texas, **U.S.B.M.R.I. No. 3712** (1943).
5. Katz: Possibilities of Secondary Recovery for the Oklahoma City Wilcox Sand, **Trans. Am. Inst. Mining Met. Engrs. (Petroleum Development and Technology),** Vol. 146, 28 (1942).
6. Stewart, Garthwaite, and Krebill: Pressure Maintenance by Gas Injection in the High Relief Elk Basin Field, **J. Pet. Tech.,** Vol. 7, No. 3, 49 March (1955).
7. Allen: The SACROC Story, **World Oil,** Vol. 140, No. 6, 170, May (1955).
8. Muskat: Our Unproduced Reserves, What Are They? **J. Inst. Pet.,** Vol. 37, 717 (1951).
9. Muskat: **Physical Principles of Oil Production,** Sect. 7.3 et seq., McGraw-Hill Book Co., New York, 1949, 1st Edn.
10. Fancher, Whiting and Gretsinger: **Loc. Cit.**
11. Paiz, Reed, and Calhoun: Relationship between Oil Recovery, Interfacial Tension, Pressure Gradient in Water-wet Porous Media, **Producers Monthly,** Vol. 19, No. 7, 3, May (1955).
12. Dunning, Johansen, Walker, Powell, and Watkins: What Detergents Did at Grover Water Flood, **Oil Gas J.,** Vol. 54, No. 19, 115, Sept. 12 (1955).
13. Kennedy: The Effect on Oil Recovery of LPG Injection, Fourth Oil-recovery Conference, **Texas Petroleum Research Committee Bul 17,** 135 (1952).
14. Hock: Use of Light Hydrocarbons for Better Oil Recovery in North Louisiana, **Producers Monthly,** Vol. 19, No. 9, 33, July (1955).
15. Meldrum and Nielsen: A Study of Three-phase Equilibria for Carbon Dioxide Hydrocarbon Mixtures, **Producers Monthly,** Vol. 19, No. 10, 22, Aug. (1955).
16. Whorton and Kieschnick: A Preliminary Report on Oil Recovery by High-pressure Gas Injection, **Drilling and Production Practice,** 247 (1950).
17. Griffith and Hollrah: High-pressure Gas Injection in the Block 31 Devonian Reservoir, **Proc. Fourth Oil-recovery Conference, Texas Petroleum Research Committee Bul. 17,** 135 (1952).



By RICHARD SNEDDON

Local PESA Convenes

For some years we have derived both education and enjoyment from attendance at the annual meeting of Pacific District PESA and this year was no exception. Immediately upon arrival at the Ambassador Hotel we were greeted by Walter Pusch, the perennial supervisor of the local group who is given a great deal of credit for the success of these yearly affairs. Thereafter we barged into the meeting hall just in time to see an interesting Bethlehem color movie, entitled, "Men, Steel And Earthquakes," which showed exactly what is required in the way of steel reinforcing and bracing to assure stability of public buildings when Old Mother Nature goes on a bebop bender and begins to shake her hips. This film should be of real value to construction engineers and executives who hire them and as far as we are concerned was another example of the bewildering scope of usefulness that a commodity can acquire through the relentless probing of industrial research.

Biographic Parallel

Following the picture, Wendell Jones, the Bethlehem executive, chairman of the local PESA, introduced the speaker, Bill Bates, assistant to the vice president of Shell Oil Company, with a series of amusing parallels that started on their respective college campuses and traced their careers to the present time. We noted, however, Wendell's failure to disclose that in his college days he was known to all and sundry as "Onion Jones." Bill Bates is a Stanford alumnus who played a pretty sharp center spot on the Palo Alto grid squad. Wendell's great claim to athletic distinction, on the other hand, is that he was assistant yell leader to Bill Geis on the California campus.

Some Worthwhile Suggestions

In his extemperaneous discussion of drilling methods Bill tossed out some real challenges to equipment manufacturers and to oilfield operators. He expressed the opinion that there had been little improvement in the drilling business in recent years and that about the only consequential advance had been in the realm of mud engineering. He propounded some interesting theory, supported by experience data, on the cause of stuck drill collars, which he claimed were largely the result of too large a differential between hydrostatic head and formation pressure. He noted that sticking usually occurred opposite a porous zone and could be relieved by letting up on mud pressure which is commonly about 500 psi above that of the formation. He strongly recommended to the equipment industry that they develop a centralizer that would remain static while the drilling string revolved freely on the inside.

Proposed New Tools & Techniques

Bill cited the need for a new type of whipstock that would introduce deviation trends more gradually and avoid the introduction of key seats, one of the drilling industry's prime worries. He also voiced the opinion that there was room for the development of some more accurate and less expensive method of locating and drilling stratigraphic traps to substitute for the costly wildcatting now employed. Other pregnant suggestions made by the speaker were (1), a proposal to reduce drilling costs by the use of lighter drill tubing; (2), one to stimulate study by engineering researchers of the drillability of rocks by different media and under varying pressures. He pointed out here that the ductility of rocks changes markedly with changes in pressure and that there was need for a more comprehensive understanding of this entire area of operation; and (3), efforts should be made to acquire more extensive data on the factors involved in percussion drilling and on the effectiveness of rock bits and diamond bits used in conjunction therewith. Keeping the bottom of the hole clean was advocated as an important factor in the rate of penetration, and adequate centralization was again noted as an essential of effective operation.

The Speed Champion

In conclusion, the speaker broached the need for a more positive method of formation testing and defined some of the significant elements of such a device. Altogether, Bill Bates gave drillers and the equipment industry more constructive criticism and suggestion than anyone has dared to offer in a long time, proving once more what we have often contended that he is one of the best engineering analysts in the business. Anyway, even as an outsider we thoroughly enjoyed his presentation and the generous response from the large audience indicated that we were not by any means alone in our appreciation. Incidentally, Bob Safford,

WILDCAT WALTONIAN

John R. McMillan, executive vice president of Monterey Oil Company, is a tall, pleasant mannered chap, who has had a wealth of experience in the exploration, production, and administrative phases of the petroleum business. He is a native of Vermont but at the age of seven moved with his parents to Los Angeles and is now pretty generally regarded as a Californian. He is an alumnus of Poly High here, extended his education by a two-year term at University of California, and then moved to California Institute of Technology, whence he was graduated in 1931 with a degree in engineering. His first contact with the oil industry took place in his college years when he worked as a vacation time draftsman for Barnsdall Oil Company. Upon graduation he became a full time employee of Barnsdall, beginning as a roustabout and ending after 14 years as land man in the geological department. Meantime, he had acquired an intimate understanding of the tools and techniques employed in exploration, drilling and production, and had become well and favorably known in the petroleum industry.

In July, 1943, John was employed by Fullerton Oil Company as petroleum engineer and assistant manager of field operations and in a comparatively short time was elevated to the manager's post. Four years from the day he started with Fullerton he was elected vice president and Director and subsequently was largely responsible for the unitization of the Clearfork formation of the Fullerton field in West

Texas, a project involving some 600 wells on 24,000 acres, in which the Fullerton Oil Company was operator. He was named president of the Company in April 1954, following the resignation of W. W. Valentine. When the properties of Fullerton Oil Company were acquired by Monterey in late 1954, John McMillan was elected executive vice president and director of Monterey Oil Company.

During the 25 years, more or less, that he has been associated with the oil industry he has been an active member of various industry technical groups, particularly the AIME Petroleum Branch of which he became chairman in 1954. He has also served as finance chairman of two national conventions of AAPG, and was for some time a member of the API Production Division General Committee. Extra-curricularly he has officiated as president of the Oil Club of which the Petroleum Club of Los Angeles is an indirect offshoot, and has been a popular member of the Wildcat Committee of Western Oil & Gas Association through which he has attained some stature as an actor.

..As an accompanying illustration shows, John's principal hobby is game fishing. With his good lady, Eleanor, he angled for the big ones and has caught them too, in the waters of Guaymas, La Paz, Las Cruces, and Mazatlan, and there isn't a fish in the Lower Gulf that doesn't tremble at the approach of these persistent Waltonians. In addition to his piscatorial expertness, he also has unquestioned talents in the speculative enterprises such as dominoes and gin rummy, perhaps because of a Caledonian ancestry of which he is more than proud. Altogether John McMillan is a good mixer and a top citizen by all measures, and it is easy to understand why he has been so successful both business wise and socially.

national executive secretary, closed the business meeting with one of his customary rapid fire resumes of organizational activity, past and projected, and gathered a few more votes for his nomination as the man who says more in less time than any after dinner speaker who ever went out after a dinner to speak after.

Bebop and Blue Iron

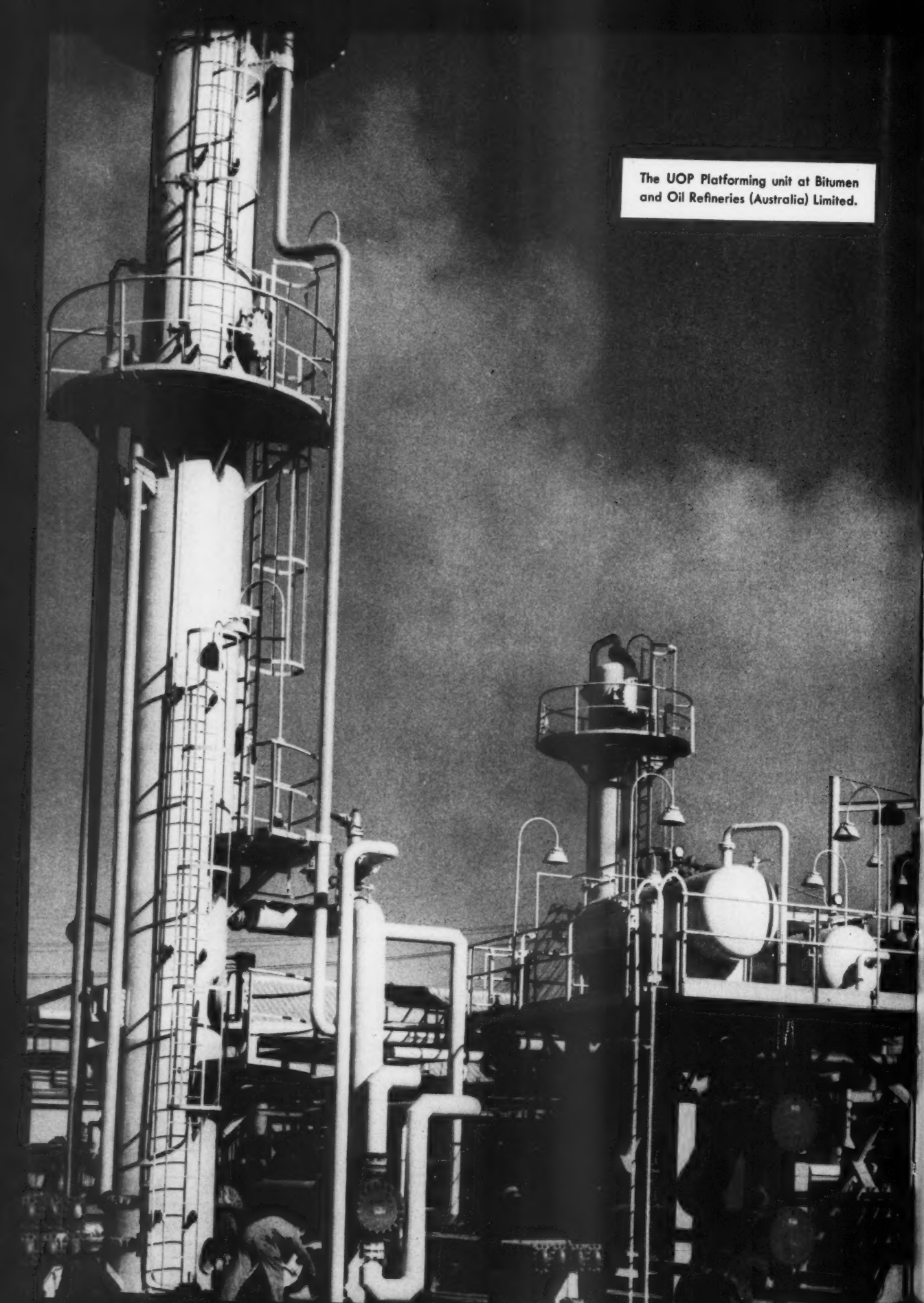
Next in order was what one of our neighbor's children calls "the cockletail" session. Here and at the dinner that followed we ran into a rare stash of celebrities. Among them were Dave Faulkner, director emeritus of PESA and one of the real daddies of the organization; John Spalding, his capable and always friendly successor down Torrance way; Charlie Reichert, the Past Grand Potentate of Al Malaikah Shrine, also a proud pusher of the blue iron; Lloyd Hill, another high elevation member of the National notables; Jack Pike, president of Republic Supply Company, past president of PESA, and one of the industry's sharper divot lofters: Roy Johnson, outstanding Harvardian, Nineteener, and bebop pianist, who in his serious moments is executive vice president of Republic; Glen Pitts, vice president of the same in charge of sales, and a talented purveyor of equalizing aqua for the PPP; or fellow juror, Bud Russell, with whom we have settled many a weighty point of jurisprudence; Ted Sutter, executive v.p. of Baker Oil Tools, another PESA founder, accompanied by R. C. Baker, Jr., secretary treasurer of the Baker enterprises; George Anderson, sales chief and noted crooner of Scottish ragtime; Don Sewell, the advertising genius, and Norman Swaton near relative of our old friend, Joe Swaton.

From Coalinga and Compton

Others noted in the gathering were Monty Montrose, national president of PESA who did an excellent job presenting Rod Durkee's last year speech; Bob Harcus, Garth Nicolson, and Bill Brooks, three well known and highly regarded higher-ups from the BJ division of Borg-Warner Corporation; Bill Powell, the estimable prexy of Emsco, with Bill Kinder, the top citizen of Coalinga, now stationed in Dallas, A. H. Miller, secretary-treasurer, Tiny Bush, the sales chief and Ernie Fowks, one of the Nomad founders and a man of consequence in the burgeoning uranium industry; Walter Losk, Bill Goertz, and Clayton Rose, a new combo that is doing right well for itself; Pert Sargent and Verdi Boyer, a pair of substantial delegates from Sargent Engineering Corporation; Lee Wardle and Tom Ashe of Globe Oil Tools, ambassadors of goodwill for the thriving village of Los Nietos; Hal Howard and Dave Bradbury, high brass from Howard Supply Company; Ed Embury, the collegiate looking chap from the W. R. Guiberson plant; I. J. McCullough, Harry Hester, and Herm Schaller, representing the McCullough Tool Company with distinction; Rodney Durkee, John Neale, Jim Hughes, Doc Otis, and Val Forsythe, a considerable quintet from Lane Wells; and B. Reinhold, the erudite head of the firm that bears his name, with his top aides, B. Jr., and W. B.

Also Present

Others spotted in the groups were



The UOP Platforming unit at Bitumen and Oil Refineries (Australia) Limited.

Australian Refiner Reports on 3 Years Operation of UOP Platforming Unit

By E. R. Griffin
General Manager
Bitumen and Oil Refineries (Australia) Limited
Matraville, New South Wales

BORAL has the distinction of being the first refiner outside the American continent to install a UOP Platforming unit, and in more than three years it has operated absolutely trouble-free. Since it went on stream in July, 1952, it has been shut down only for inspections and for cleaning or changing catalyst. In our opinion, this remarkable record was not only achieved because of careful operating control, but reflects, as well, the sound processing techniques of operation provided through the application of UOP fundamental basic research and a well designed and engineered process.

E. R. Griffin

The unit at our refinery set a world record for catalyst life, the first charge having lasted for nearly two years. It was dumped on July 1, 1954, having processed 253 barrels of charge per pound of catalyst. A Platformate yield of 94.1 per cent, based on reactor charge, was realized over the entire run and at the time of dumping, it was still making the 72 octane (motor method) standard grade of motor fuel called for in the local market with the addition of only 1.2 cc. TEL. Making such an octane proved to be an easy job for the Platformer even though Middle East naphthas, processed in the unit, generally are among the least desirable charge stocks for catalytic reforming operations.

Now, the standard grade motor fuel has been increased to 79-81 (research), and a premium grade of 90 research octane has been introduced, both of which are being produced by the Platforming unit without difficulty.

The decision to install the Platforming unit, which had an original design capacity of 1,500 barrels per stream day, came after an exhaustive investigation in which it was determined that this process would give us the flexibility we needed in the selection of a charge stock. Our refinery in Sydney then consisted of a 5,000 B/SD two-stage distillation unit and an asphalt converter unit. A synthetic crude oil, to which was added a small quantity of cracked gasoline, was obtained from the Persian Gulf area for processing into Diesel oil, fuel oil and various grades of asphalt. The gasoline was distilled and sweetened for sale in the local market.

Economics dictated that the processing of whole crude would be more profitable than running synthetic crude because low octane straight run gasoline obtained from whole crude could be upgraded in octane by catalytic reforming with much higher yields than could be obtained by conventional thermal reforming, which was expensive and unsuitable for our requirements.

Having decided to install Platforming, we asked UOP to send an engineer to Australia to assist us in planning for the construction of the unit. Engineering, detailed drafting and purchasing of items not readily obtainable in our country for erection of the Platformer were handled by UOP, which licensed the process. Refinery personnel built the unit.

We decided in 1954 to expand our refining facilities and improve the quality of our other petroleum products. After discussions with UOP on the best course to follow, we concluded that the Unifining process would be most adaptable to our needs. Universal was requested to prepare the engineering and detailed drafting and to purchase hard-to-get items as well as to prepare the design and engineering for revamping the Platformer to increase its capacity to 2,500 B/SD, and to prepare the process designs for a 10,000 B/SD topping plant.

Exhaustive work in Universal's laboratories resulted in the design of a "tailor-made" Unifining unit which processes a combination of Diesel fuel and aromatic light oil produced from an oil gas plant located in Sydney. The Unifining unit has made BORAL one of the first refiners in the world to offer Diesel fuel purified by the use of hydrogen.

In conclusion, we would like to say that our association with UOP not only has enabled us to keep abreast of the most modern refining techniques, but it has made available to us technical "know-how" which has proved invaluable.

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O. O. DALE

...his middle name is Oil

His first name is Orie. His middle name *must* be Oil. Certainly, O. O. Dale has helped make history during his 30-odd years of work in the oil patch. Back in 1932, Orie helped set the record for the world's deepest oil well... at 10,900 feet. In 1937 he worked on the first wildcat to be completed solely on electric log information. 1940 found him engaged in the first bulk cement job in California at Greeley. In 1945 he introduced plastic plugging to California. He handled the first squeeze job ever to go over 4500 psi. Twenty of Orie's years of pioneering have been spent in the BJ Service, Inc., organization.

Orie and men like him have made BJ Service. Men with years of experience in working under all types of well conditions. Men who can find answers when problems arise. Men you can depend on to get the results you want.

BJ Service brings you the finest equipment, the newest materials, the latest in researched techniques for oil well services. But BJ Service's real strength lies in men like Orie Dale who do the job as only they know how to do it, who work long hours without rest to complete it, who head for the yard after it's all over secure in the knowledge that the job has been done right.

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Of Operations in Egypt

Had the pleasure of a very elevating session with Ira Cram, senior vice president of Continental Oil Company, during his recent visit to Los Angeles, and learned much about the Company's operations in Egypt and adjacent areas. The firm is drilling now a second well on the Egyptian concession that includes some 55.9 million acres. In this Continental's net interest is 15 million acres. Net interest in other concessions, in Libia, British Somaliland, and Italian Somaliland, are 11%, 7.7 and 9.9 million acres respectively. Canadian interests and domestic amount to 9.5 and 8.4 million respectively, making a grand total of 62.1 million. This, if you are interested in parallels is the equivalent of a 3.9 mile wide belt around the earth at the equator. The African country, particularly in the war sections, is a trifle dangerous for operations, since a careful search has to be made for left-over mines before the construction crews move in.

GEARS FOR INDUSTRY
THE Lufkin LINE
OIL FIELD PUMPING UNITS

Turkish Bazaars Have Everything

V. J. Fawcett

A visit to Turkey is hardly complete without a visit to one of their bazaars. Surely, these native shopping centers must be the birthplace of our "supermarket." For centuries, the Turks have had supermarkets.

Some of them are so large and so integrated that visitors and even natives have been known to get lost browsing in and out of their innumerable corridors lined with shopkeepers who merchandise everything from a Turkish Rug to a Pakistanian Piccolo!

In Istanbul, not far from the Hilton, at the "KAPALI CARSI," it was fun to trade with the Turks. On this shopping expedition, among other things, purchased an Omega Wrist Watch, of which I am very proud. The gilt edge Certificate of Guarantee is written in French, Serial No. BK-12504 and is countersigned by President Adrien Rene, Omega Watch Company, Geneva, Switzerland.

At this point, it may seem a little irrelevant to pull in Lufkin Pumping Units and Lufkin Precision Gears, both of which are in operation for Turkish Petroleum Corporation at Batman and Raman, Eastern Turkey. I can't read the French on my watch guarantee, but as everyone knows, the reliability of such a precision product by a firm known around the world goes unquestioned—even if written in Sanskrit.

Buyers of Lufkin products likewise, do not necessarily have to be bi-lingual to recognize quality and craftsmanship. Like Omega, Lufkin products, too, are known around the world for dependability, durability, and design-ability.

And as they say in Turkey, "SAGLAM."

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Where We Go From Here

Mr. Cram also made a projection of future domestic supply and demand, based on prevailing trends. He estimated that consumption will be up 50% in the next ten years which means that we shall have to find more oil in the next decade than we have found in any previous one to date. With increasing difficulty in finding new upland oil and the constantly rising demand, our main hope of keeping supply and demand in balance without building up imports, lies in offshore production. Best prospects for this are in Louisiana. California has good prospects too but at the moment available areas are limited by the fact that our offshore waters become too deep too fast. Olen Lane, vice president in charge of western operations for Continental gave a very complete picture of Continental's west coast operations, and in his remarks ventured the prediction that Washington would some day be listed with the producing states.

Just Ducky

Dashed over to the California Club one recent lunchtime to learn something of Ducks Unlimited from the lips of Mr. Ducks Unlimited himself, Will Reid, chairman of Hancock's Board of Directors. This was another decidedly educational seance that started off with a motion picture showing how the organization is fighting drouth and the encroachment of cities, and conserving and expanding water areas and marshlands, in order to provide nesting and feeding places for the birds. This column already contains more statistics than enough so we will skip any mention of the

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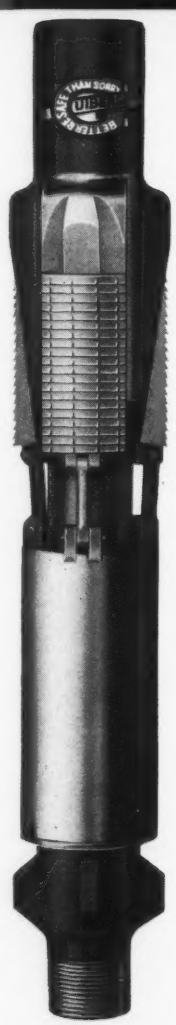
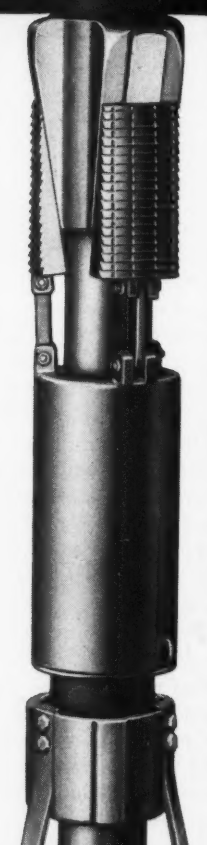
Guiberson tubing catcher gives you low-cost insurance against accidents, lost time and production. It lets you forget the danger of cork-screwed or telescoped tubing. Should the string part or fall, the Guiberson tubing catcher automatically stops tubing with a drop of less than three inches.

Guiberson tubing catchers are made in all casing sizes and weights.



TYPE E
TUBING CATCHER



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number of square miles so added or the increase in duck population that has resulted from the good works of DU. But they are plenty! The first picture was followed by a goose hunting sequence taken up in the Canadian northlands and it presented an exciting peek at a flock of blue and snow geese that was nothing short of fabulous. If you want a classic example of real resourcefulness, you should see the Indian hunters in this one making decoys out of toilet paper, and you should hear them making like a flock of geese themselves from a nearby blind.

What About You?

This was certainly an enjoyable program for a guy like ourself who has never bagged anything but his pants. As a matter of fact, the only time we ever tried duck hunting we shot a valuable hunting dog and are still wanted by a game warden back in Manitoba. However, to be serious for a minute, this DU thing is a mighty worthy enterprise and anyone who derives pleasure from going out after the web-footed beauties should do his part to share its good works. If you are interested, and you should be if you are a duck hunter, contact Will Reid at Hancock, or Hal Howard at Howard Supply Company, and find out what you can do about it.

Bits of This And That

By way of last minute round-up, we regret to announce the death of Frank Wells, retired oil man of Coalinga, Lester Keim, well known U. S. Steel executive of Pasadena; and Roy Mead, consulting petroleum engineer and geologist of Glendale. Doug Graham and his esposa, Senora Maria Graham, are gallivanting in South America. Their itinerary includes Caracas, Rio, Montevideo, Buenos Aires, and Lima. Al Tietze is back home and doing fine after a seige at the Good Samaritan. George Curyea is recuperating at his home in Santa Paula from a mastoid operation. Jim Gosline will be guest of honor at a meeting of Pi Epsilon Tau on April 18. Frank Morgan has opened offices in the Roosevelt Building where he will be associated with Frank Jr., petroleum geologist of Casper, Wyoming, in oil exploration and development. Frank will continue his interest in Ampol and the search for oil in Western Australia. The Petroleum Club will stage a Cinco de Mayo party on May 4, with Charlie Perkins bossing the deal and Mrs. Cliff Sandland in charge of arrangements. PPP will hold its spring barbecue at Union Oil Company's Stearns picnic ground out Brea way on May 5. The dicks are looking for Dee Taylor who masqueraded as a foreign correspondent at the Desk & Derrick Club cocktail party and even had the effrontery to acknowledge the thanks that were extended to him for all the nice articles he had written about the girls.

Appointment of Jack Whitehouse to the Shell Oil Company public relations staff in charge of press relations was announced by J. H. Sembower, Pacific Coast public relations manager for Shell Oil Company.

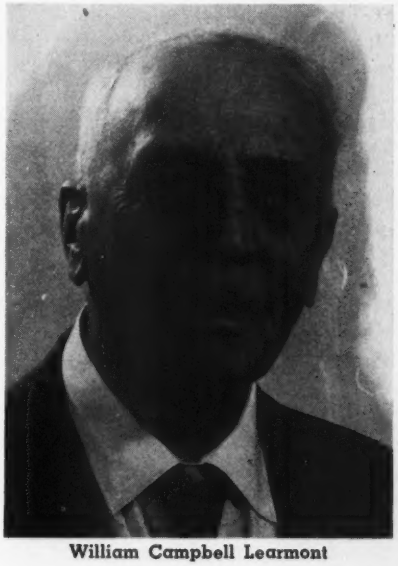
Whitehouse, who replaces William Hoyt, now heading Shell's public relations activities in Tulsa, Oklahoma, will be assigned to the Los Angeles office, headquarters of Shell's Pacific Coast area.

A native of Los Angeles, the new Shell public relations representative has edited a number of weekly newspapers in this area. For two years he was in the public relations office at U.C.L.A., then became managing editor of the morning and evening newspapers in Yuma, Arizona, followed by a period as associate editor of Desert Magazine.

Returning to Los Angeles in 1955 he worked with several national public relations accounts as a freelance agent before joining Shell Oil Company. Whitehouse's most recent activity was with the "Dodge for Life" safe driving program for Dodge Division, Chrysler Corporation.

Oil Pioneer Celebrates 90th Birthday

That amazing Caledonian, William Campbell Learmont, who has traveled more miles than Marco Polo and has had more adventures than Robinson Crusoe, has just celebrated his 90th birthday, and is still foraging about with enough energy to keep a star basketball player in constant motion. Willie is a native of Edinburgh, Scotland, where he attended George Watson College, later was graduated in law from Edinburgh University, and finally was seized with an unquenchable yen to come to the United States. This he did in 1892 and shortly thereafter married a braw lassie, named Edna Young, from Kansas City. Four years after that he took off with his bride for California and has been a considerable citizen of this rapidly burgeoning bailiwick ever since.



William Campbell Learmont

His first job here was with Pacific Electric Railway whence he skipped to the East Whittier Land & Water Company, then headed by George Chaffey. He lived in Whittier for some time, then joined Standard of California in the Right of Way department and was transferred to Oakland where he remained for six years. Eventually, however, he returned to Los Angeles as manager of the Right of Way department and discharged the diverse responsilibities of this important post until his retirement in 1933.

Before coming to this country to stay, Willie had become famous as an actor on the legitimate stage and had played with the Compton Comedy Company in every nook and cranny of England, Scotland, Ireland, and Wales. One of the real thrills of his interesting career came to him when at the age of 81 he took a trip over to the old country. While browsing through the Shakespeare museum at Stratford-on-Avon he picked up an old poster, advertising a play that was to show in the Stratford Theater, and, bless his soul, among the **dramatis personae** as big as life was the name, William Campbell Learmont.

Up to the present time Willie Learmont has enjoyed excellent health. He has journeyed back and forth across the Atlantic almost as often as the **Queen Elizabeth** and thoroughly enjoys each trip. Three years ago, at the age of 87, he took a jaunt to the Orient to visit his grandson, then serving in the U. S. Navy in Japan, and had more fun than people traipsing all over the Far East. Although he became an American Citizen a long time ago, he has never lost his love for Auld Scotia and her people, and he has entertained many an audience even in recent years with stirring recitals of Scottish ballads.

Last December he attended the Wildcat Play at the Palladium and looked sharp as the proverbial tack all decked out in tux and black tie. Incidentally, he is the father-in-law of Ed Bedford, manager of lands for Western Gulf Oil Company, and, of course, the grandson he visited in Japan was Ed's son. Willie Learmont is a fine gentleman whom we have found it good to know and we join with his relatives and friends in wishing him a belated Happy Birthday and lots of good health and good luck in the years ahead.

Slip-Retardant Floor, Deck Paint Developed

A slip-retardant floor and deck paint is being introduced by the Du Pont Finishes Division after 15 months' field testing on tug and barge walkways, on decks of tankers, oil loading platforms, refrigerator car floors, and refinery catwalks.

The slip-retardant agent incorporated in high qality enamel is nonmetallic and thus sparkproof. The new anti-slip paint has proved effective where oil, grease and water cause slippery surfaces.

Conventional slip-retardant paints usually employ hard gritty type antislip agents which when sprayed cause excessive wear on spray gun equipment. Since Du Pont Slip-Retardant Paint contains a relatively soft anti-slip agent, it may be applied by spray or brush. Two coats are recommended, the second following drying overnight.

Periodic stirring is required to reincorporate the skid-resistant agent. The new paint is available in light gray and maroon.

Howard Supply Company Appointed Brunner Air Compressor Distributors

Brunner Manufacturing Company, Utica, New York, fifty year old manufacturer, has appointed Howard Supply Company, distributor of oil field supplies and Petroleum Marketing Equipment, as distributors of its line of air compressors for service stations and other industrial uses.

Howard Supply Company has a total of twelve warehouses in California, and Brunner Compressors will be available from all locations.

Standard Awards SC Scholarships

Standard of California will present two leadership scholarship awards of $400 each during the 1956-1957 academic year to undergraduate students of the University of Southern California at Los Angeles. The awards are part of a countryside education program sponsored by Standard. Actual selection of the winners will be supervised by the SC scholarship committee on the basis of leadership, financial need and scholastic achievements.

New draftee: "That Santa Claus guy sure messed up this deal."

Buddy: "What's the beef?"

Draftee: "Fifteen years ago I asked for a soldier suit—and now I get it."

Johnston Stainless Welding Rods

PROVEN QUALITY SINCE 1931

•

A. P. JOHNSTON

1845 E. 57th St. - Los Angeles 11, Calif.

LUdlow 8-2508

LANE-WELLS today!

published for the busy oil man by Lane-Wells Co. — one of the Dresser Industries

L-W RADIOACTIVITY LOGGING GIVES QUANTITATIVE RESULTS

Quantitative analysis in many forms of logging operations has long remained a dream. Now comes an awakening, as Lane-Wells Radioactivity logging opens an ever-widening way to accurate determination of formation characteristics by wire-line methods.

For some time operators have been able to predict porosity in carbonate reservoirs from Lane-Wells Neutron curve with extremely close correlation to results obtained by core analysis.

Now Lane-Wells engineers have expanded this application to include a method of evaluating porosities in sands and shaly sands with an accuracy well within the need of practical requirements. For instance, in one well this procedure showed the average porosity for an entire zone to be 17.8%. Core laboratory figures for the same zone showed 18.1%, a difference of only .3%!

So far this method has not been applied to all areas, but it has proved itself in such oil country as the Denver-Julesburg Basin, the Green River Basin, the Powder River Basin, the San Juan Basin, the Big Horn Basin, and the Cuyama Valley. Little doubt remains that the method will prove valid from a practical standpoint in many other areas as well.

Reproducible accuracy makes possible the ability of Lane-Wells Radioactivity logs to be used as a quantitative analytical tool. From the standpoint of the laboratory analyst, the ability of any given device to reproduce results exactly under identical conditions is the strongest measure of its accuracy and reliability. This the Lane-Wells Radioactivity logs can accomplish without equal. And when one considers the remarkable sensitivity and detailed delineation of the curves recorded by this process, that, indeed, is a remarkable accomplishment.

The time has not yet arrived, of course, when a wire-line tool can produce an accurate prediction of productive capacity, gas-oil ratio, pressure decline and a host of PVT data. But consider this: By means of such tools as the Lane-Wells Radioactivity log, the operator now can obtain by wire-line more accurate downhole information than could his fellow of a few years ago employing more cumbersome empirical methods.

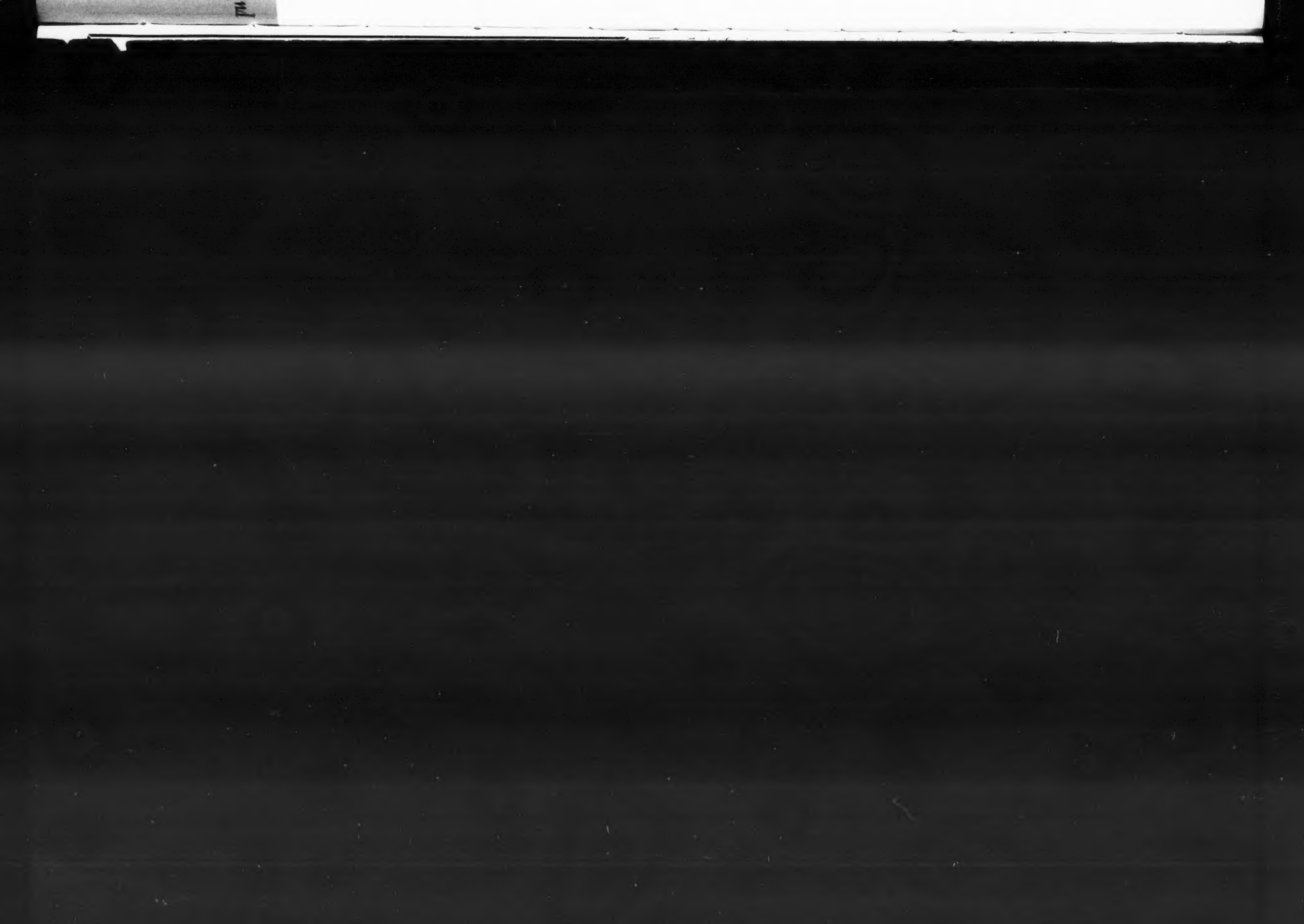
To obtain the most complete picture in the quickest possible time, operators can run Lane-Wells Gamma Ray and Neutron logs simultaneously. This Dualized logging gives the operator as complete a sub-surface picture as can be coaxed through a length of cable in one operation. Dualized logging retains all the important characteristics of both phases of Radioactivity logging. The simultaneous curves equal or better the individual curves in all respects and the running time is cut in half. Operational procedures remain essentially the same for both types.

As in other types of Lane-Wells logs, the collar log forms an integral part of the Radioactivity log, making it a simple matter to orient wire-line measurements to casing.

There are many more reasons operators have ordered Lane-Wells Radioactivity logs by the tens of thousands. Check F-1 on the attached card to learn all about them.

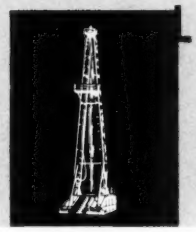
WANT MORE INFORMATION?

More information on items here will be sent to you gladly on request. A code number appears at the end of each article. For additional information about that item circle that code number on the reply card at the bottom of page 8. Just mail the card — we'll pay the postage.



LANE-WELLS

today!



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CORGUN GETS CORES WHILE THEY'RE HOT

Cores, like news stories, have to be "hot" to be valuable. Yesterday's news and hours-old cores have little informative value. The Lane-Wells Corgun gets cores to the surface while they are still newsworthy to the geologist and production engineer.

Speed alone, however, does not guarantee representative cores. But when wire-line speed combines with other Lane-Wells core - protective measures, the resulting cores arrive at the derrick floor—by wire—brimful of significant data.

In the first place, the core extraction method reduces the chances of contamination to a minimum. The Corgun fires the core barrel into the formation and encloses the core instantly without a prolonged interval of exposure to well fluids.

Secondly, only the Lane-Wells Corgun core barrel eliminates the shattering ram effect of closed-end barrels.

Thirdly, and maybe most importantly, the Corgun gets the cores you want from the region in which you want 'em. Why? Because zones for coring are chosen on the basis of wireline measurements; i.e., Electrologs, Radioactivity logs, etc. It follows then that a coring system run on a wire-line will correlate better than one run on tubular goods. Elementary, what? Of course, to really tie the cores to a hairline zone, simply run the Corgun in tandem with the Electrolog. When the curves match, the Lane-Wells operator touches off the Corgun, and in a matter of minutes you have the cores in hand—by wire.

Checking F-2 on the attached card will bring you more information about the Corgun.

THRU TUBING COMPLETIONS SAVE DAYS OF RIG TIME

Dismissing the drilling rig before the well is brought in, or the cement has set, was just another impossibility a few years ago. Which meant that the operator had to pay for days of standby time, with nothing he could do about it.

But today Lane-Wells Thru-Tubing completions offer a convenient means of curtailing dead rig time. Because, with special Lane - Wells equipment and personnel on the job, wells can be logged and perforated safely, speedily, and accurately without a drilling rig after tubing has been set.

There is nothing makeshift about this equipment. Four different types of Koneshot perforators are available, including the powerful Swing-Jet which is housed in a 1¾" O.D. carrier. But in the horizontal shooting position this gun has an effective O.D. of 4⅜", thus permitting the use of a heavy explosive charge.

Two sets of Radioactivity logging instruments are available, one in 1¾" and the other in 1⅜" sizes. For all practical purposes, the curves from these two miniaturized down-hole tools correlate exactly with those of their big brothers.

And certainly there is nothing makeshift about the Lane-Wells crew and surface control equipment either. The first is especially trained for this type of operation and has had plenty of experience in putting it into effect. The second, from control truck to well head, has been built for this one job. So, to realize the full benefits of Thru-Tubing completions, obtain this service from Lane-Wells, the one service company that can provide the equipment and personnel for the whole job.

Check F-3 on the attached for more information.

ABSTRACTS—CURRENT AND PERTINENT

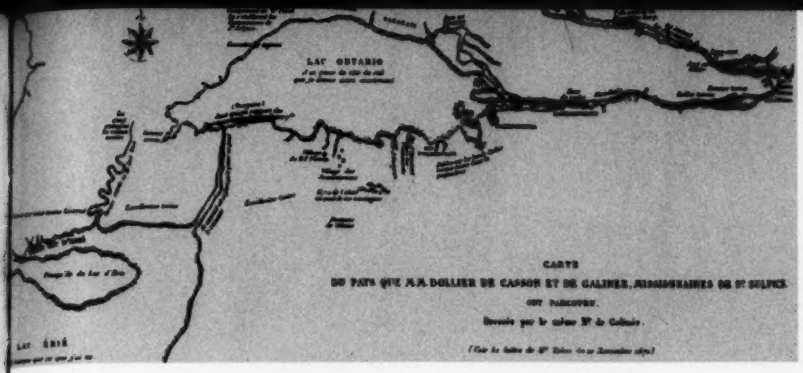
WEST TEXAS GETS NEW FIELDS As Cambrian sands prove out as reservoirs. Pre-Ellenburger rocks add millions of barrels to reserves at comparatively shallow depths. Study gives Radioactivity correlations in key wells. F-4
"Cambrian Production Opens New Trend in West Texas," by Aaron W. Cook, p. 99, World Oil, Nov., 1955.

NOW IT'S BACTERIA That might point the way to new oil discoveries. Abnormal quantities of methane-oxidizing bacteria in subsoil overlying known oil deposits hint of new exploration procedure. F-5
"A Microbiological Method of Prospecting for Oil,"by Dr. R. J. Stawinski, p. 104, World Oil, Nov., 1955.

THIN-HOLE DRILLING Offers possibilities of major savings but embodies heavy problems. Equipment is small, mobile, material- and labor-saving. But stuck tools and slow drilling rates prove troublesome. F-6
"Will Ultraslim-Hole Drilling Pay Off?" by D. H. Stormont, p. 92, Oil & Gas Journal, Oct. 31, 1955.

"HOW'S THE AIR DOWN THERE?" May be the next inquiry about drilling mud in the well. Mud alone was used for years. Then came the trial with straight air. Now a mixture of mud and air has proved to have many advantages over air or mud alone. F-7
"Aerated Mud Drilling," by Roy A. Bobo, R. S. Hock, George S. Ormsby, p. B-46, Petroleum Engineer, Nov., 1955.

CONFUSED WELL HISTORIES Are straightened out by Radioactivity logging. Before water flooding an oil field, operators applied modern logging methods to provide a clear sub-surface picture. F-8
"Radioactivity Logs Help Solve Water-flood Problems," by N. J. Mellies and C. W. Clark, p. 4, TTT, 3rd q., 1952.



FIRST AMERICAN OIL MAP?

This ancient map, prepared by a seventeenth-century French missionary, shows a "Fontaine de bitume" somewhere in New York or Northern Pennsylvania. This may be the earliest map indicating an oil location in the U. S.

PACKERS HAVE IMPROVED SINCE THE SEED BAG

The sack of flaxseed tied to the end of a string of tubular goods had to serve as a packer in grandpa's day. If everything worked right, the water in the well swelled the seed to shut off the annulus — just like a four-horse parlay.

The system spoke highly of the old timer's ingenuity to make do with the materials at hand. But its reliability left a lot to be desired. Packers improved, of course, and now they are better than ever. But for a time the trend seemed to be toward making them bigger and more complicated — and more expensive.

Some bright engineer (Lane-Wells on the job again) figured that most jobs of acidizing, pressurizing, fracturing, water flooding, and the like did not need something with 117 moving parts which, when they all worked, would withstand pressures that would tear the casing to shreds. All this, of course, with a price tag to match. He figured that a simple, reliable packer, economically priced, would do most jobs of packing off, without the need of hauling out to the field a design-engineer's display piece with all its attendant hardware.

Hence, the T.O.P. Packer.

The T.O.P. Packer has proved reliable, effective, safe, and economical on hundreds of jobs in the short time since its introduction. It sets easily, holds firmly, and retrieves reliably. It has enough built-in safety features to satisfy the most suspicious toolpusher.

The T.O.P., of course, stands for Tension Operated Packer, which provides quite a story in itself. Lots of packers set by applying weight to the tubing, but guessing the right amount of weight doesn't come easy, particularly with short strings. Much more exact, predictable, and controllable is the setting of the T.O.P. by pulling UP on the string after turning to the right about 10 revolutions.

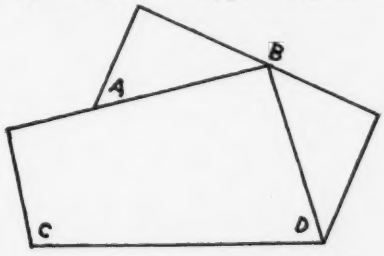
The T.O.P. retrieves with equal simplicity. Simply lower the tubing string to unlatch the slips and haul it back aboard. Obviously, nothing in this operation would strain the capabilities of any drilling crew.

While Lane-Wells engineers advocate the use of the T.O.P. against bottom-hole differential pressures up to 3000 psi, the tool can be used for high-pressure squeeze and fracturing jobs if the annulus is suitably loaded. Otherwise such a job calls for the packer equivalent of Big Bertha.

Check F-9 on the attached card for more data on this common-sense tool.

SUPER BRAIN BREAKER

A piece of paper 8½" x 11" is folded once as in the accompanying diagram. The length of AB as shown is 5⅝". Find CD.



ANSWER TO SUPER BRAIN BREAKER IN LAST ISSUE: Diameter of the large circle is 64.64".

CHECK AND SIGN THIS CARD—DROP IT IN THE MAIL NO POSTAGE REQUIRED

Complete information about the items appearing in this publication is available without charge to qualified oil company employees and oil well operators. Please fill out the forms completely, giving Company and Title as well as your address and indicate whether or not you want to be placed on the mailing list to receive more information on these subjects as it becomes available.

LANE-WELLS TODAY!

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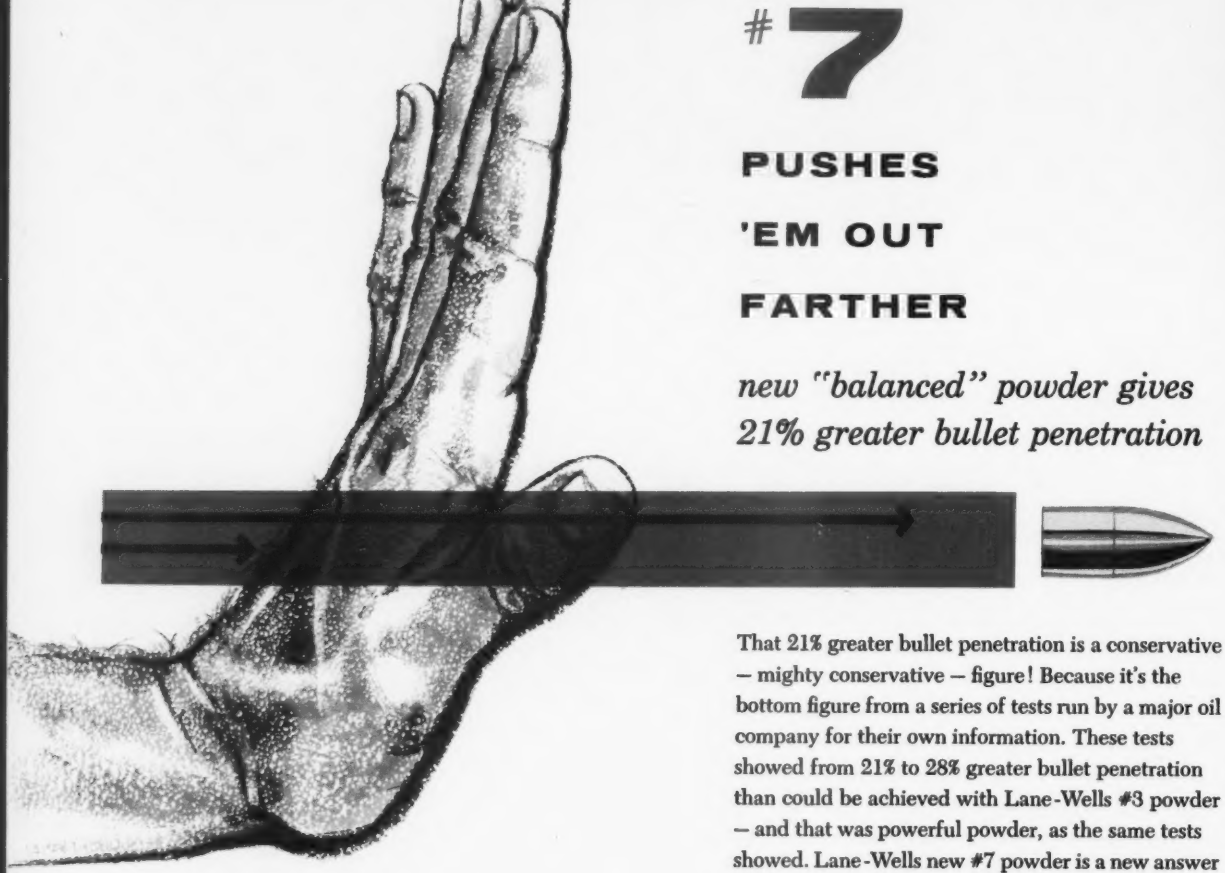

#7

PUSHES 'EM OUT FARTHER

new "balanced" powder gives 21% greater bullet penetration

That 21% greater bullet penetration is a conservative — mighty conservative — figure! Because it's the bottom figure from a series of tests run by a major oil company for their own information. These tests showed from 21% to 28% greater bullet penetration than could be achieved with Lane-Wells #3 powder — and that was powerful powder, as the same tests showed. Lane-Wells new #7 powder is a new answer to the age-old ballistics problem of how to get more power behind the bullet without increasing the strain on the gun. #7 has been so formulated and "balanced" that it burns slower, with lower peak pressure, but *longer*...thus building up a tremendous "push" behind the bullet that drives it deeper into the formation. And there's no price premium for #7 powder — just another example of Lane-Wells efforts to give better service.

LANE WELLS COMPANY

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Tomorrow's Tools - Today! ®

With Drilling Contractors

The natural aftermath to action of both large and small operating organizations in extending active operations to foreign countries is the current boom market for oil field supplies.

In view of the great and growing increase of drilling and production of oil in other parts of the globe, related remarks made recently by Arthur W. McKinney, National Supply Company president, appear of interest to the contract drilling industry.

Speaking before a recent meeting of the American Institute of Mining and Metallurgical Engineers in New York, McKinney said that Middle East reserves are far ahead of those in the United States, production in other Free World nations now exceeds that in this country, and that consumption is increasing faster abroad than it is here.

"To those of us who supply the drilling and production end of the industry—and to those who work in the fields, at the refineries, along the lines of transportation—these facts have an important meaning," McKinney said, and added:

"They mean that more of us are going to have to learn the complex element of export business."

He emphasized that oil field suppliers must be fully capable of servicing distant operations everywhere, and setting up machinery and rigs in remote and barbaric regions, as well as in the civilized areas of the world.

"Drillers today are entering areas where the people used to think oil came out of the ground in five-gallon cans," McKinney declared.

"Drilling was never easy, even in the United States," he added. "Imagine what it is like where the terrain is stubborn at best, and hazardous at worst; where the weather makes mere survival a difficult proposition; where the local government may be suspicious and even hostile toward foreign businessmen; where there is no reservoir of skilled labor; and where the crews must operate thousands of miles from their sources of supplies."

The supply man called attention to the Cities Service Company-Richfield Oil Corporation project in Dhofar province on the Arabian Sea, a country that has seen little change since Biblical days.

He disclosed that to reach the drilling site, 135 miles inland, it was necessary to blast a road across mile-high mountains. Water crews had to go ahead of the main caravan to dig wells.

Huge Shipment

The operation included shipment of more than 20,000 items and valued at about $2,000,000 which were transported thousands of miles from the United States.

Among the shipment were 16 portable homes, two prefabricated metal warehouses, 50 kegs of nails, 100,000 board feet of lumber, and 490 tons of muds and chemicals for drilling.

There were also two ice cream freezers, 10 shower stalls, and 200 pounds of navy beans.

When loaded at Houston everything had to be so placed that the first things to come off would be the last things to go on, McKinney mentioned.

The freighter was anchored about one mile offshore when it reached its destination. Two war-surplus LCT's carried the cargo to shore, including the drilling machinery and equipment, road building tools, transportation vehicles, water well equipment, and all types of large and small material.

Machinery Test

Taking no unnecessary chances, McKinney said that in order to be sure that the drilling rig would work smoothly when it reached Dhofar, it was assembled at Houston and the machinery run for several hours. It was subsequently torn down for shipment.

The oil field supply executive expressed belief that this type of operation indicates the future trend of supply business.

He foresaw the demand for oil field supplies in foreign operations as only beginning and paralleling the inevitable expansion of overseas exploration in drilling.

This is still a pioneering industry full of adventure," he said. "It's just as challenging as it ever was and calls for the best in the field."

In conclusion, McKinney expressed the industry's need for engineers capable of learning the field of export supply, due to the widening of drilling and production in countries elsewhere in the world.

Contract driller on Franco-Western Oil Company's new pool discovery on Section 29-24s-18e in Kings County was Hagestad Drilling Company.

A wildcat project that is likely to be closely watched by the drilling industry is Carrizo Valley Oil Company's No. 1-13 well starting in San Diego County. It is located north of the Mexican border by about 20 miles and 30 miles northwest of the town of El Centro, near Carrizo Creek.

San Diego County at times during past years has been the scene of some wildcatting, but test wells failed to come up with commercial showings.

The latest excitement down San Diego way was stimulated by The Texas Company's wildcat in the San Clemente area in Orange County and no great distance from the San Diego County line. This test found some oil and although in only small amounts, pointed to an entirely new California province.

Willits Test Drilling Stops

Drilling operations have been temporarily suspended at 1901 feet with the L. H. Scott Company, Inc., Percico No. 1 exploratory venture on Section 5-18n-13w in the Willits area, Mendocino County.

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than mud alone ... it means ...
GOOD SERVICE
wherever you drill
Dotted throughout the Mid-Continent and Rocky Mountain regions, Magcobar has 75 engineers and 105 dealers to serve the oil operators who are daily increasing our Nation's oil reserves in these shallow production areas.
These men work as a team . . . the Magcobar-trained mud engineer and his independent-businessman-dealer-friend . . . to give operators in these areas the best mud service and products available.
In good weather or bad . . . in remote or easy-to-get-to locations . . . the oil operator's call for service gets prompt attention from this Magcobar team. It's a kind of "fire-horse" dedication to serve their industry that knows no boundaries. Call them when you need mud or service.
MAGNET COVE BARIUM CORPORATION
HOUSTON, TEXAS
Magcobar
Complete
DRILLING MUD SERVICE

Field Development

Wilmington Drilling Set

Aeco Corporation is ready to drill its No. 313-2 well on Section 5-5s-13w and near the intersection of Broad avenue and "A" street in the Wilmington field. This is the second of seven wells listed for the southwest flank of the field. The first well, No. 313-1, was finaled in both the Ranger and Terminal zones at about 3700 and 3800 feet.

Santa Fe Springs Test Stops Drill

Deep zone development in the old Santa Fe Springs field took it somewhat "on the chin" by the suspension of Rothschild Oil Company's Monte No. 1 near the intersection of Clark and Verne streets. The well was some 1500 feet southwest of General Petroleum's discovery well and if it had met with success would have put in action a lively drilling campaign in the townlot sector, a short distance northward. Meantime, General Petroleum and several other operators are continuing their development drilling to the new deep sand.

Prado Dam Wildcat Digs

Drilling at this writing was proceeding below 1100 feet with the Isaac M. Stewart, Stewart No. 1 exploratory well on Section 29-3s-7w at Prado Dam in Riverside County. Empire Drilling Company is doing the work.

Monterey Scores Offshore Discovery

Monterey Oil Company and The Texas Company have clicked with a new shallow zone discovery from their island offshore Seal Beach. The new well, Monterey-Texas No. 1 on Section 22-5s-12w, has been completed on the gas lift for 347 barrels of 20.7 gravity oil a day from 3644-3964 feet. The well was directionally drilled to a total depth of 3965 feet and bottomed a considerable distance laterally from the island site, according to John R. McMillan, Monterey executive vice president. This latest completion followed the successful drilling of 10 wells from the island. However, all of the 10 are tapping a deeper zone.

Boyle Heights Well Interesting

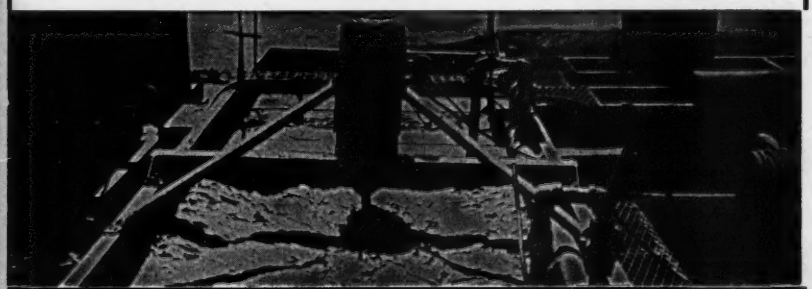
As this is jotted down Richfield Oil Corporation's Industrial Community No. 1-A-5 at Boyle Heights is drilling and coring around 4200 feet. The company's third well in the area, unofficially it is described as promising much in the way of production. Richfield clicked with its townlot discovery at Boyle Heights just before last Christmas. The second well was completed a couple of months ago for between 150 and 200 barrels a day and is standing shut in as is its predecessor.

Boundary Buttes Tests Scheduled

In tune with its recently announced drilling program, El Paso Natural Gas Company is preparing to take down two stratigraphic test wells at East Boundary Buttes, Apache County, northeastern Arizona. Designated as Four Corners No. 3 and No. 4, the well will be put down to approximately 1000 feet on Section 19-4ln-31e. The tests are designed for information to point the way to deeper drilling.

OUR ENGINEERS

are experienced specialists in California oil well drilling mud problems. They have years of on-the-job-know-how, plus a complete line of proven mud products with which to help you drill your oil wells.



BROWN MUD COMPANY

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"Sure, I use both types"

(most drillers do!)

"There's no argument between 3-cutter bits and 4-cutter bits...each one has its uses, each has its own advantages. So I just pick the type that my experience tells me will do the best job in the situation I'm meeting right then. Sometimes one type makes it easier to drill straight hole; other times, the other makes faster footage—depends on the particular conditions.

"I use a lot of H. C. Smith bits. They're as good bits as I've ever found...make a lot of hole for me, and don't give me trouble. Since they make both 3-cutter and 4-cutter bits, H. C. Smith men haven't any ax to grind. I've found I can depend on what they tell me, and, lots of times their recommendations can help point out the best bit for the tough job. Ask around —you'll find that drillers who've used H. C. Smith bits like 'em!"

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Seal Beach Test Drills

Drilling is moving ahead not far above 10,000 feet with The Texas Company's Bryant Estate NCT-L No. 1 test on Section 1-5s-12w. Listed as a 12,000-foot test, the well lies about a mile south of the company's Bixby Ranch well, which quit a year ago just short of 12,000 feet.

Honor Rancho Wildcat Starts

The Texas Company is under way with its NCT-1 No. 13 on Section 8-4n-16w in the southeast part of the Honor Rancho field. It is aimed for an approximate depth of 11,500 feet. At nearby Castaic Junction, Humble Oil & Refining Company's N. L. & F. No. 55 on Section 14-4n-17w is drilling below 8000 feet. It is an extension test. In the same sector, the company the other month completed N. L. & F. No. 83 on the gas lift for 83 barrels of net 28.8 gravity oil from 10,937 feet through a one-quarter-inch choke. Open was the interval of 10,785-10,825 feet.

Sylmar Test Set To Drill

Among the olive trees in the Sylmar area of Los Angeles County, Western Gulf Oil Company is moving ahead at a preliminary stage with its Carey No. 1 wildcat test on Section 4-2n-15w. Location is a mile from the town of San Fernando and in the same section where Lady Luck failed to nod for a Shell Oil Company wildcat about 20 years ago.

Gault Wildcat Goes Off Board

Southwest of Gault in San Joaquin County, Sunray Mid-Continent Oil Company's Shell-Brovelli-Sec. 4 Unit No. 1 wildcat on Section 4-4n—6e has been abandoned at 7298 feet after basement was cored. Before giving up the test, a final check was made with electric log, dipmeter and sidewall sampler.

Deer Creek Test Working

Sierra Development Company is down around 1900 feet with its Culver No. 1 test on Section 21-22s-27e in the Deer Creek area of Tulare County, after stopping somewhat higher to allow for equipment repairs.

Harbor Oil Search Okayed

The Los Angeles City Harbor Commissioners have contracted with Stanley & Stolz, petroleum geologists and engineers, for a complete survey of the whole Los Angeles Harbor, including tidal water land in the outer harbor, to determine possibilities of oil development. Particular attention will be centered on the outer harbor area where some geologists are of the belief that rich oil deposits lie beneath the ocean floor and have advised drilling a well to gather practical information. It was officially announced that in the event oil is found in the outer harbor tideland sector, all of the proceeds will be used for development of the harbor, commerce and fisheries. Stanley & Stolz will be paid on a per diem basis, with the fee depending on the number of engineers and employees actually engaged in the work. The firm also will deal with royalties and other terms of oil and gas leases in which the municipal port is interested.

North Montebello Project Redrilling

East Standard Corporation's Castle No. 1 wildcat well on Section 31-1s-11w in the north Montebello area is redrilling at 4700 feet. The project the first time down was taken to 5200 feet. Terminal Drilling Company is in charge.

Saticoy Well On Production

Shell Oil's new Edwards No. 1 well on Section 30-3n-21w at Saticoy in Ventura County at last reports was putting out 425 barrels of 34.9 gravity oil through a 16/64-inch orifice, and 372,000 cubic feet of gas a day from plugged depth of 7025 feet. In the Canada Large area, Shell is drilling in the shallower formations with its ACL No. 3 on Section 36-4n-23w. Edwards No. 1 was drilled on contract by A. D. Rushing Drilling Company, and the chores on ACL No. 3 are in the hands of Bell & Burden.

Santa Barbara Wildcats Drill

Signal Oil & Gas Company's State No. 208-28 test on Section 18-4n-29w at Rincon in Santa Barbara County is drilling under 3100 feet. At Cat Canyon, Pacific Western's Alamos No. 32 on Section 6-8n-32w is making hole at 4000 feet. On Section 23-9n-33w, Douglas Oil of California's Apex-Atlantic-Porter No. 17-23 was last reported producing 39 barrels of 11 gravity oil, cutting 50 per cent, from plugged depth of 2980 feet.

Camulos Test Written Off

Having encountered little of worth to a total depth of 5708 feet, Continental Oil Company has pulled out of its N. L. & F. No. 2 wildcat on Section 36-4n-18w at Camulos in Ventura County.

South Mountain Wildcats Listed

The Texas Company's drilling program in the Bridge sector at South Mountain in Ventura County includes two 8000-foot tests, the natural sequel to the new pool found by Richardson-Earl No. 1. Designated as Texas-Union Hyde NCT-1 No. 1 and Texas-Union-Richardson-Earl NCT-1 No. 2, the former is a northwest offset and the latter a northeast offset to the discovery well and they are located on Section 14-3n-21w. The discovery came in last January at the daily rate of 121 barrels of 32.6 gravity oil from 7211-7720 feet.

North Merced Wildcat Staked

Sam Malis has staked location for Parker No. 1 wildcat on Section 14-6s-13e in the North Merced sector of Merced County. It will be a 4000-foot gas test, with Gene Reid Drilling contractor.

Rosedale Ranch Explorer Listed

All set to drill is Ne-Tex Oil Corporation's Lerdo No. 1-36 wildcat test on the southwest quarter of Section 26-28s-26e in the Rosedale Ranch area, Kern County. Located on a farmout from Standard Oil of California, the project is aimed for Miocene oil sand in going to approximately 4200 feet, but may be carried deeper if the shallower objective zone is not up to expectations. Wells in the Rosedale Ranch field proper are drawing from the Miocene formation. Ne-Tex has offices in Las Vegas, Nevada, and at 6363 Wilshire boulevard, Los Angeles.

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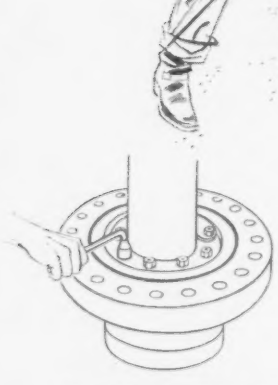

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Oceanic Forms New Partnership

Oceanic Oil Company and J. Barth & Company have organized the Oceanic Drilling and Exploration Company, a limited partnership with a capitalization of $925,000. Through the medium of comparable partnerships Oceanic has boosted the company's production two and one-half times since 1950, President Fred M. Keller pointed out. He announced that funds of the new syndicate will be given over to exploration in the Taft-Fellows area of Kern County, where in recent years Oceanic has developed six important and lucrative discoveries. Under a program mapped out, two wells will be started in the immediate future and it is anticipated that 15 to 20 exploratory wells will be drilled in this sector during the next two years.

Ohio Oil Plans Uranium Branch

The Ohio Oil Company, in association with Arthur E. Pew Jr. of Philadelphia, has wound up arrangements with the U. S. Atomic Energy Commission looking toward the sale of uranium concentrates by the associates to the Atomic Energy Commission, J. C. Donnell II, Ohio president, has announced. In the first venture of its kind to be conducted by private enterprise, the associates propose to turn out the uranium concentrate from uraniferous lignite ores which are known to exist in the western part of North and South Dakota.

Bishop Oil Acquires Peace River Ground

Canadian Bishop Oil, Ltd., has obtained about 40,000 acres of leases northeast of Peace River in Alberta, Canada. The reservations are some 240 miles north of Union Oil Company's "Red Earth" discovery, which has opened a wide region to new drilling. Canadian Bishop, a subsidiary of Bishop Oil Company of San Francisco, plans to combine the new ground with the 180,000-acre holdings of four other operations in return for about one-fifth interest in the whole 220,000-acre block.

Buttonwillow Wildcat Drills

Drilling at last reports was under 6300 feet with The Texas Company's Breen No. 1 wildcat project on Section 14-28s-23e at East Buttonwillow in Kern County. The company's Capital-Vaccaro No. 2 on Section 36-31s-29e in the Mountain View-Arvin area currently is putting out three barrels of oil a day from plugged depth of 8055 feet.

Belgian Anticline Test Wells Drilling

Drilling is moving steadily ahead at a depth below 5200 feet with Tide Water Associated Oil Company's Southern California Petroleum No. 63-A-8 test on Section 8-30s-21e in the Belgian Anticline area. On Section 16-30s-21e, Standard Oil's No. 35-16y continues to dig on down at a depth of 4000 feet.

Midway-Sunset Activity Steady

Exeter Oil Company has two new drilling jobs in sight for its Midway-Sunset properties. Wilmax No. 16-3 will be drilled on Section 16-32s-23e as a southeasterly offset to the company's No. 16-1 deeper pool discovery of last November. Murphy Fee No. 15 will be drilled on Section 28-32s-24e as an Exeter pool development well. One mile southeast of the Exeter find, Oceanic Oil Company's General American No. 67x has been completed successfully after being deepened from 4399 to 4670 feet. The well came in pumping 236 barrels of net 23.2 gravity oil daily. The new and deeper well brings Oceanic producer on the General American lease to eight of which seven are tapping higher sands in the Republic zone. Oceanic's CWOD No. D-4-7 on Section 7-32s-23e is drilling at 800 feet.

Kings County Find Chalked Up

Franco Western Oil Company is credited with a new pool discovery at Pyramid Hills in Kings County through the medium of its Crileco-Westslope No. 81-29 on Section 29-24s-18e. The well was completed for 75 barrels of 38 gravity oil a day from 4390-4407 feet. Total bottom is 4470 feet. In the Stratford area of Kings County, Geochemicals Surveys' Campbell No. 63X-36 on Section 36-20s-20e has been abandoned at 11,711 feet.

Cymric Test Drilling Ahead

Drilling is near 700 feet with G. R. Nance's shallow test on Section 7-29s-21e in the Cymric area of Kern County. The well is on the Richardson lease where other wildcatters have tried and failed.

Kern Bluff Test Staked

N. G. Snyder has staked Titus No. 3 on Section 18-29s-29e in the Kern Bluff area. A followup to a discovery, Titus No. 2 on the section, was recently completed for 10 barrels of 14 gravity oil a day on the pump.

Wheeler Ridge Wildcats Staked

Richfield Oil Corporation has programmed two additional tests in the Wheeler Ridge area. ROC KCL G will drill on Section 13-11n-20w to a target depth of 7500 feet. KCL F No. 63-36 will go to objective depth of 9000 feet on Section 36-11n-20w, where the company recently made a discovery with its KCL F No. 52-36 in the Lower Miocene formation. It was shut in after flowing at the daily rate of 150 barrels of 41.5 gravity oil and 883,000 cubic feet of gas.

Lost Hills Wildcat Digs

Arthur C. Fisher is drilling at an intermediate depth with his Frantz-Schatz No. 1 wildcat on Section 14-26s-21e and three and one-half miles northeast of Lost Hills production. The venture was spudded-in about two months ago with a light rig and after setting surface pipe at 200 feet, drilling outfit was moved from location. However, the operator returned to the well and after cleaning out resumed operations which are listed to go from 4500 to 5000 feet. At the extreme south tip of the Lost Hills field, Superior Oil Company has leased 320 acres on the north half of Section 11-27s-21e and about a half-mile from the town of Lost Hills. Not too far away lies Standard's Cahn lease wells. Those with unproved ground in the area, include Union Oil, Richfield Oil, Tide Water Associated and The Texas Company.

Intex Oil Begins Two Wildcat Tests

Intex Oil Company of Bakersfield is moving ahead in the earlier stages with two Kern County wildcat wells. Law No. 13-3 on Section 3-29s-27e in the Oildale sector is aimed for the Fairhaven and Chanac zones in an area where about a year ago the company recorded two dusters at 2700 and 3400 feet, respectively. On the westerly fringe of the Mount Poso field, another company test is headed for 2300 feet for a look at Vedder possibilities at that location.

Union Avenue Test Drilling

Ohio Oil Company's KCL-M test well on Section 8-30s-28e in the Union Avenue area in Kern County is not far above target depth of 9000 feet. Rocky Mountain Drilling Company is in charge of the project, whose success will also benefit other acreage holders in the sector, including Tide Water Associated, Union Oil and M J M & M Oil.

Dudley Ridge Test Suspended

Water and gas apparently was recovered on test at 1206-1210 feet with Jacalitos Petroleum Company's Kings County wildcat at Dudley Ridge and the well has been suspended due to its non-commercial aspect to date. Known as Friend-Anderson No. 1, location was on Section 11-23s-19e.

Tejon Flats Wildcat Quits

A depth of 13,134 feet wrote finish to Sunray Mid-Continent Oil Company's SP-Tejon No. 23-11 explorer on Section 11-11n-19w at Tejon Flats in Kern County. Golden Bear Oil Company, as operator at this writing, had reached 8000 feet with its Rudnick-Klipstein No. 1 test on Section 8-11n-19w in the general area.

Goosloo Test Growing Deeper

Drilling is below 11,300 feet with Kern County Land Company's Continental-Doheny-KCL No. 72-28 wildcat on Section 28-29s-25e, southeast of Goosloo in Kern County. San Joaquin Drilling Company is the contract driller.

New Emsco Bulletin

Emsco API Pumping Units for Heavy Loads are completely described in a new eight-page bulletin, No. A-246, which covers the features, specifications, construction details and performance of Emsco 114, 160, 228, and 320 Pumping Units. Unusually comprehensive visual treatment including large illustrations, cross sections, exploded views and photos of gears, gear train, sub assemblies and all essential parts of the pumping unit, make the bulletin unusually easy to read and understand. For more information, write Emsco Manufacturing Company, Box 2098, Los Angeles 54.

Wise Guy (after entering loaded bus)—"Well, Noah, you finally got here. Is the Ark full?"

Driver—"Nope, we needed one more monkey, now we've got him."

Rocky Mountain NEWS

Colorado—Idaho—Montana—New Mexico—Utah—Wyoming—Western Canada

Wyoming

Reports of gas shows in a test of the Pinedale Unit in Sublette County have not been confirmed by El Paso Natural Gas. The well is the No. 5 Unit, c se 5-30n-108w and has been drilled to 12,800 feet. It is a mile northwest of the discovery well drilled last year by El Paso and associates and which flowed 2,400,000 cubic feet of gas per day.

With prospective completion of the Pacific Northwest Pipeline this year, drilling in Sublette County has been stepped up. Nine new locations were reported in various parts of the county for the second week of March.

In the northwestern part of the state, Stanolind Oil and Gas Co. recovered 150 feet of oil from the Dakota at the interval 5580-5640 feet from the No. 1 Govt., se nw se 31-57n-98w. The well is in the Little Polecat area of Park County and operator was last reported drilling below 7215 feet.

Two miles south of the Meadow Creek field, Brinkerhoff Drilling Co. abandoned the No. 1 Govt.-Brinkerhoff, although some showings were encountered. The test was in c nw nw 28-41n-78w, Johnson County.

Carter Oil abandoned its Horse Gulch wildcat in the Tensleep. The test was the No. 1 Govt.-Horse, c nw sw 17-50n-91w, Big Horn County. It was drilled to 4004 feet total depth.

Chicago Corporation and Republic Natural Gas are drilling a wildcat two miles north of the Lost Soldier field in Fremont County. Thus far, no shows have been reported, and last drilling depth was around 8550 feet. The test is the No. 1 Govt.-Sultemier, c sw se 28-27n-90w.

Canada Southern Oils was approaching its objective in its Lakota test in the Schrader flat area of Natrona County. The well is the No. 35-1 Govt., ne ne sw 35-31n-82w, and is 20 miles southwest of Casper. The Lakota is expected at 2500 feet.

In the Boone Dome area of Natrona County, Richfield Oil will drill the No. 1 Northern Utilities, e½ sw se 10-35n-85w, for a Frontier test at about 6500 feet.

Fifteen miles northwest of Gillette, Carter Oil abandoned the No. 1 Govt.-USA, se nw ne 11-51n-75w, in the Barber Creek area of Campbell County. The well was drilled to 6504 feet total depth.

Stanolind Oil and Gas has completed an offset in the Cottonwood Creek Unit of Washakie County for an indicated 555 barrels of oil per day initial. In an eight-hour test through 18/64 inch chock, the No. 6 Unit flowed 185 barrels of oil from the Phosphoria. It was drilled to 5930 feet total depth and plugged back to 5905 for completion. The well is located in ne nw ne 18-47n-90w.

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Colorado

Phillips Petroleum is drilling a confirmation to its North Douglas Creek discovery in Rio Blanco County. At the No. 1 Douglas A, e½ nw ne 19-1s-101w, operator recovered 125 barrels of oil per day on pump from the Weber, which was topped at 7512 feet. Three barrels of water per day also were recovered. The confirmation in the No. 1 Douglas B, s½ nw se 18-1s-101w.

Love-Miller Drilling has recovered oil from the J sand at the No. 1 Naggatz, se se se 9-8n-54w, in Logan County.. A first test at 5228-37 feet recovered 450 feet of oil, and a second test at 5236-50 feet recovered 480 feet of oil and 915 feet of water. Operator has set pipe and is waiting on cement.

Lion Oil has completed the No. 6 Stites, c nw nw 8-1s-56w, Washington County, with a production of 354 barrels of oil per day from the J sand at the interval 5387-90 feet. The well, which is west of the Bobcat field, was drilled to 5510 feet total depth.

Continental Oil was drilled around 5200 feet at the No. 1 Hasser, nw nw ne 28-25s-49w, in Bent County.

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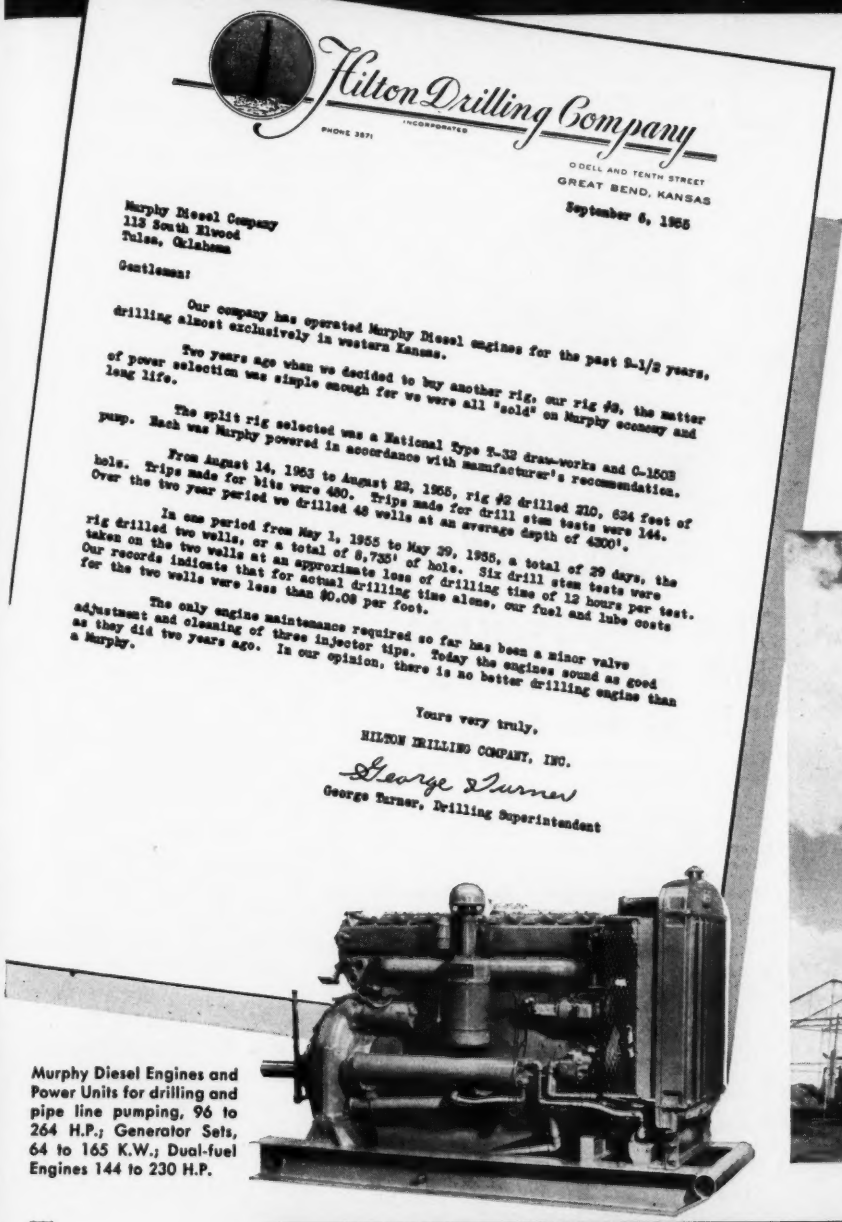

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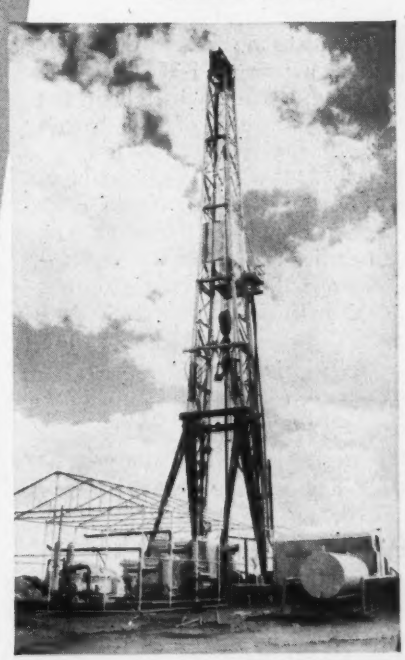

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Frank Landauer and associates recovered 286 feet of free oil in a drill stem test at 6275-6302 feet in the J sand at the No. 1 A Rocchio, nw nw ne 9-4n-60w, Morgan County. Also recovered was 1135 feet of heavily oil cut mud. Operators were waiting on tools to complete the well.

Three miles northwest of the Fort Morgan field, Arrowhead Exploration and Delta Drilling have brought in a gas producer from J sand. Operators recovered an estimated 2,225,000 cubic feet of gas per day in a test at the interval 5690-5711 at the No. 2 State, c se se 16-3n-58w, Morgan County. The well was drilled to 5920 feet total depth.

United Oil and Gas has completed the No. 2 McCulloch, nw se sw 27-34n-10w, La Plata County, for 1,866,000 cubic feet of gas per day from the Cliff House formation. Total depth is 5617 feet.

New Mexico

British-American Oil Producing ran pipe with plans to perforate at the No. 1 Marya, nw ne ne 1-25n-13w, San Juan County, after a half hour test resulted in recovery of five barrels of oil at the interval 4832-93 feet.

Humble Oil and Refining is continuing to test the No. 1-B Navajo, c nw sw 29-32n-20w, in San Juan County. In an earlier test of the Pennsylvanian, the operator recovered 3203 feet of oil at 5605-26 feet. Current testing is at 5980-6080 feet.

Nebraska

Miracle-Fifer Drilling and Gibraltar Oil recovered a flow of 280 barrels of oil per day at their Banner County discovery, the No. Vedene, c nw nw 2-17n-56w. Production was from the D sand through perforations at 6448-54 feet. In a drill stem test at 6454-67 feet, operators earlier recovered 1720 feet of oil, 90 feet of oil cut mud and 90 feet of mud. A drill stem test of the J sand recovered 150 feet of oil and gas cut mud.

Rite-Way Oil and Investment was continuing to swab at the No. 1-B Schneider, c sw nw 15-18n-53w, Banner County. Before sandfracing, swabbing recovered four barrels of oil per hour from the J sand at 5310-14 feet.

Shell Oil Co. was preparing to run log at its No. 18 Travis, c 15-16n-54w, Kimball County, after finding shows in the Pennsylvanian. Operator drilled to the granite with total depth 8441 feet.

Maxey Drilling has completed the No. 1 Evertson, c se ne 30-14n-55w, Kimball County, with production of 240 barrels of oil per day from the J sand. The No. 1 Evertson is a mile and a half southeast of Torgeson field production. Recovery was through perforations at 6417-25 feet.

Montana

Mountain States Drilling and Phillips Petroleum were drilling around 9100 feet at their Berwind Unit test, the No. 1 NP, c lot 2, 33-9s-21e, in Carbon County. The well, which will be carried to the Tensleep at 14,500 feet, found oil and gas cut mud in the Elk Basin formation.

Atlantic Refining staked location for a third test in the Wolf Springs area of Yellowstone County. It will be the No. 1 Karman, c se sw 7-7n-32e and will offset previous production.

Seaboard Oil will drill to the granite at its No. 1 Loberg, se ne 26-30n-36e, in the Hinsdale area of Valley County. Operator was drilling below 6500 feet at last report, with no shows encountered.

Phillips Petroleum et al was drilling below 5930 feet at the No. 1-A Schultz, c se ne 24-30n-45e, in the southeast Lustre area of Valley County.

Richfield Oil abandoned the No. 1 Lentz, c nw se 12-10n-37e, Rosebud County, after redrilling to 3089 feet total depth in the Otter. No shows were encountered.

Carter Oil Co. was preparing to complete its No. 2 Horton, c se nw 29-7n-32e, South Wolf Springs area of Yellowstone County, after recovering oil from the Amsden at 6158-6227 feet. Rate of production on the test was not estimated.

North Dakota

Phillips Petroleum and R. M. Ballard are continuing to test at the No. 1 Braathen, ne nw 29-162n-95w, Divide County. In the first day's test, operators pumped 45 barrels of oil from the Madison at 7076-85 and 7089-92 feet.

Gulf Oil was conducting additional tests of the Madison at the No. 1 Pierre-Federal, nw sw 28-148n-104w, McKenzie County. The well had been drilled into the Bakken, but tests there were unsuccessful and the well was

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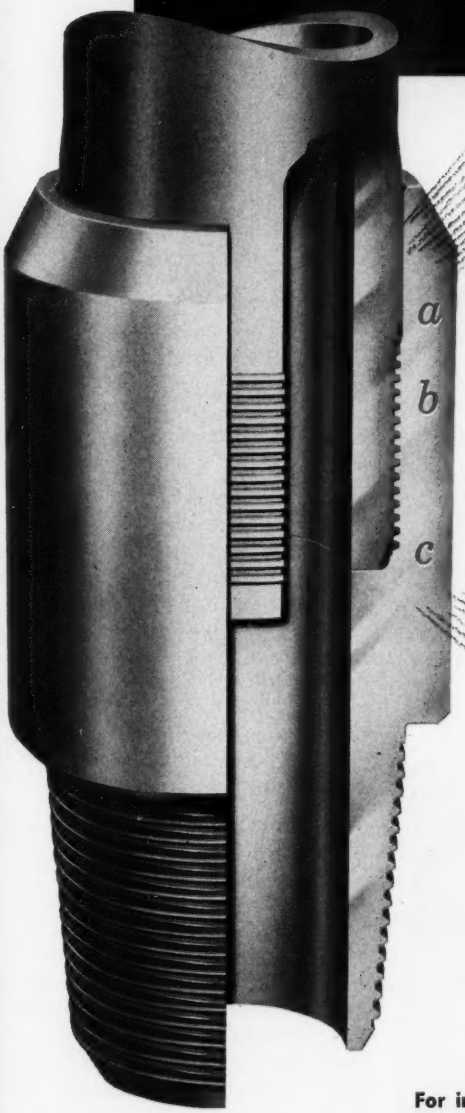

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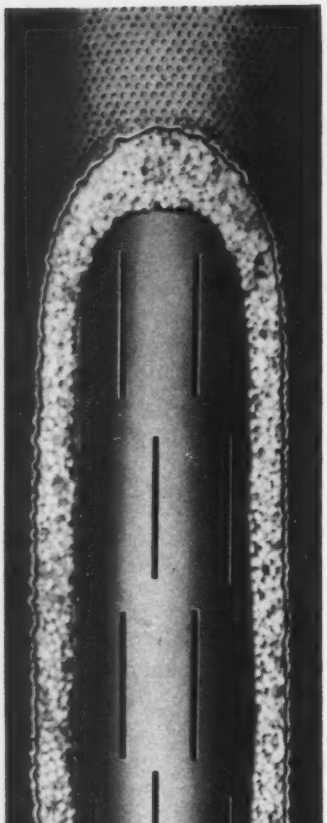

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plugged back to 9440 feet.

Calvert Drilling was approaching its Mission Canyon objective, expected at about 5500 feet, at the No. 1 Sinclair, se se 11-163n-88w, in Burke County.

Sohio Petroleum abandoned the No. 1 Lindemood, nw ne 31-164n-86w, in Renville County, at 5292 feet total depth. On a drill stem test in the Charles, operator recovered 480 feet of oil but also 3727 feet of salt water.

To the southeast of the No. 1 Lindemood failure, Sohio is drilling a Bluell field extension, the No. 1 Burns, sw sw 17-163n-85w.

Cardinal Drilling has scheduled a 5000 foot Red River test in Bottineau County. The well is the No. 1 Andrieux, sw ne 2-161n-74w, and is 12 miles east of Bottineau.

Utah

Sinclair Oil and Gas was coring below 6320 feet at its Grand County wildcat, the No. 2 San Arroyo Unit, se se nw 22-16s-25e, after recovering gas at the rate of 1,993,000 cubic feet per day. The gas production was from the Dakota at the interval 5860-6020 feet. This same operator drilled the San Arroyo field discovery, which was completed in the Entrada for 18,500,000 cubic feet of gas per day.

The Texas Co. was preparing to drill two extensions to its San Juan County discovery, the No. 1 Navajo, c nw ne 23-40s-24e. This well was covered gas at the rate of 4,5000,000 and 1,250,000 cubic feet per day.

Western Canada

Canadian Gulf Oil Co. has found substantial quantities of gas at its wildcat 50 miles northwest of Grande Prairie in Alberta. The well is the No. 7-32 Ponce Coup, lsd 7, 32-77-11w6. Two drill stem tests of the Paddy sand member of the Lower Cretaceous recovered gas at the rate of 4,500,000 and 1,250,000 cubic feet per day.

In Saskatchewan, Compagnie Francaise des Petroles, a Canadian subsidiary of a French oil company, found 75 feet of pay in the Mission Canyon limestone at the No. 1 Torquay, lsd 8-32-3-11w2. Nearest other production is in the Midale field 13 miles to the northeast. Shell Oil Co. drilled a failure seven miles southwest of the No. 1 Torquay.

A dual producer is indicated in the Southern Production Co. No. A-2-3 Canadian Atlantic, lsd 5, 26-47n-15w5. In a test of the Belly River formation, operators recovered 480 feet of oil. A later test of the Cardium recovered 180 feet of clean oil and 180 feet of gas cut mud, together with 124,000 cubic feet of gas per day. The well is jointly owned by Southern Production, Canadian Atlantic, Pacific Petroleums Ltd., and Calvan Consolidated Oil and Gas Co. Ltd.

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Personalities IN THE NEWS

Harold H. Smith of H. C. Smith Oil Tool Company (second from left) receiving his lapel insigne during his induction as an associate member of the Los Angeles Chapter of Nomads, March 14, 1956, from Art. Marshall of the same company. To the extreme left is the Sergeant-at-arms, Bill Brooks of Byron Jackson Company and to the right is Tom Martin of R. J. Eiche & Associates, Ritual Master.

Frank A. Morgan, for many years Vice President and Manager of Exploration, Richfield Oil Corporation, has returned to Los Angeles after more than a year in Australia and the Far East.

He will open Engineering offices in the Roosevelt Building in Los Angeles and will be associated with his son, Frank A. Morgan, Jr. petroleum geologist of Casper, Wyoming, specializing in Petroleum Exploration and Development, domestic and foreign.

Mr. Morgan resigned from Richfield in 1954. He was president of the American Association of Petroleum Geologists in 1952. He is a director of Halliburton Oil Well Cementing Company and a director of Ampol Exploration Limited, Australia.

Through Ampol he has been identified with the pioneering search for oil in Western Australia and this work will activly continued.

E. W. Allen has been elected a director of Wilshire Oil Company of California. The other directors are Joe W. Lackey, Robert O. and Donald B. Anderson and Hugo A. Anderson Jr., of Roswell, New Mexico. They are also members of the board of Malco Refineries Inc., with headquarters in Roswell. Malco acquired Wilshire several months ago.

Dr. Earl T. McBee, head of the chemistry department of Purdue University at Lafayette, Indiana, has been elected a director of Great Lakes Oil & Chemical Company.

Paula Crump, Ohio Oil Company's new receptionist in the Los Angeles office, is a native of Watford, England, having come to California last June. She relieved Mrs. Mary Ryan.

International guests at the March 14, 1956 meeting of the Los Angeles Chapter of Nomads. Left to right (standing) Stewart M. Collester of Santa Fe Drilling Co. from Australia; Gus J. Jure of D. & E. from Dhofar; P. Krijgsman of B.P.M. from Indonesia; (Seated) Ted Kopp of D. & E. from Brazil; Leo L. Goss of Santa Fe Drilling Co. from New Guinea; Herman Rynaard of B.P.M. from Indonesia.

Pyle Boys Club Holds Annual Meeting

The California Petroleum Industry sponsored Pyles Boys Camp held their annual Board meeting Monday March 5th, in the Biltmore Hotel, Los Angeles.

President R. M. "Bob" Pyles presided and received various reports from the existing committees and reappointed committees for the new year's activity. Report of the nominating committee was made by John Hancock, Hancock Oil Co., in the absence of the chairman L. L. Aubert, Bankline Oil Co. Nominated for President was Bob Pyles; Vice-President, L. L. Aubert; Sec-Treas., Rudy Schweitzer; Mr. Aubert replaced Mr. W. G. McComiskey (deceased). Further nominations included the addition of a new Board member from the San Joaquin Valley, Mr. Mort D'Evelyn Exec. Vice Pres. M J M & M, of Bakersfield. Reinstated as Board members for their second 5 year terms were S. F. Bowlby, Shell Oil Co.; F. E. Fairfield, Oil Tool Corp.; J. E. Gosline, Standard Oil of Calif.; R. H. Green Signal Oil & Gas; J. W. Hancock, Hancock Oil Co.; J. M. Hillman, Hillman-Kelley, Inc.; Fritz Huntsinger, Ventura Tool Co.; P. S. Magruder, General Petroleum Corp.; G. C. Pilkington, The Texas Co.; A. C. Rubel, Union Oil Co.

The report of the Procurement Committee, made by chairman Russ Green, recommended that the summer season 1956 Pyles Camp take 408 boys into the High Sierras for a free 2 week camping experience. The report was approved.

Chairmen for the various committees for the 1956-57 year were: Nominating, R. R. Von Hagen; Public Relations, L. L. Aubert; Procurement, R. H. Green; Finance, K. W. Kendrick, Jim Gosline, H. Hamilton, M. N. D'Evelyn, Fritz Huntsinger.

BAASH-ROSS AREA SALES MANAGERS HOLD TWO DAY CONFERENCE

Under the direction of Hal Messinger, General Sales Manager for Baash-Ross Tool Company, Division of Joy Manufacturing Company, Sales Managers from the various Baash-Ross offices located throughout the oil producing sections of the United States and Canada gathered recently for a two day conference in which the latest trends and developments within the oil industry were discussed. Around the conference table, from left to right, are shown the following: H. Klepfer, Export Manager (New York); P. Pound, Sales Manager, Mid-Continent Area; Leo Cypher, Sales Manager, West Coast Area; G. Huckabay, Sales Manager, Eastern Gulf Coast District; G. Morrison, Sales Manager, Canadian Area; E. Gearke, Assistant General Sales Manager; H. Messinger, General Sales Manager; G. Johnson, Vice President, Joy Manufacturing Company, General Manager; O. Brown, Manager, Rental and Service; B. Bronzan, Assistant General Manager; B. Brenner, Sales Manager, Rocky Mountain Area; H. Mays, Sales Manager, Permian Basin Area.

Rear, (standing) left to right: K. W. Kendrick, Standard Oil of California; Loren Hillman, Loren Hillman Enterprises; Mort D'Evelyn, M. J. M. & M. Oil Co.; Freeman Fairfield, Oil Tool Corp.; Fritz Huntsinger, Ventura Tool Co.; H. Hamilton, Huntington State Co.; Rudy Schweitzer, Signal Oil and Gas Co.; Richard Von Hagen, Lloyd Corporation; Leonard Graves, Signal Oil and Gas Co.; (seated) left to right: George Suman, Tide Water Associated Oil Co.; G. C. Pilkington, The Texas Co.; R. M. Pyles, Signal Oil and Gas Co.; John Hancock, Hancock Oil Co.; Russ Green, Signal Oil and Gas Co. Not present: Phil Magruder, General Petroleum Corp.; Cy Rubel, Union Oil Co.; L. L. Aubert, Bankline Oil Co.; Jud Hillman, Hillman-Kelley Co.; Sam Bowlby, Shell Oil Co., and Jim Gosline, Standard Oil of California.

Bob Calhoun, one of the most successful oil operators in Texas, is a Southern California visitor. Business and a vacation called him to the Pacific Coast.

Edwin W. Pauley, of Beverly Hills, oil producer and leading industrialist, has been elected chairman of the Board of Regents of the University of California, it was announced in Berkeley. Pauley, who has been a member of the board since 1939, has served on the board longer than any other appointed regent. His election was unanimous.

George Atha, Orange County oil producer, will return to his San Marino home around mid-April from a vacation in Hawaii. He flew to the Pacific Islands on last St. Patrick's Day.

John Earl Jardine, Sr., 84, a director of Union Oil Company of California, died at his Pasadena residence. Dean of Southern California investment bankers, Mr. Jardine was a resident of Pasadena for 63 years.

Chiksan Adds Three Men To Western Sales Force

Chiksan Company, Brea, California, has announced the appointment of three new Salesmen for the Western Region. In making the announcement, G. R. Winder, general sales manager, stated that the enlarged force is needed to keep pace with the industrial growth of the West and the increasing demand for Chiksan swivel joints, tank car, tank truck and marine loading arms, Weco unions and other Chiksan equipment.

Two of the new men, Edwin P. Illsley and John E. Burkett, will operate out of the Brea home office serving Southern California. Joseph P. Beyer will headquarter at the Oakland office which serves Northern California. All will service accounts in general industry, refining, and chemical and petrochemical industries.

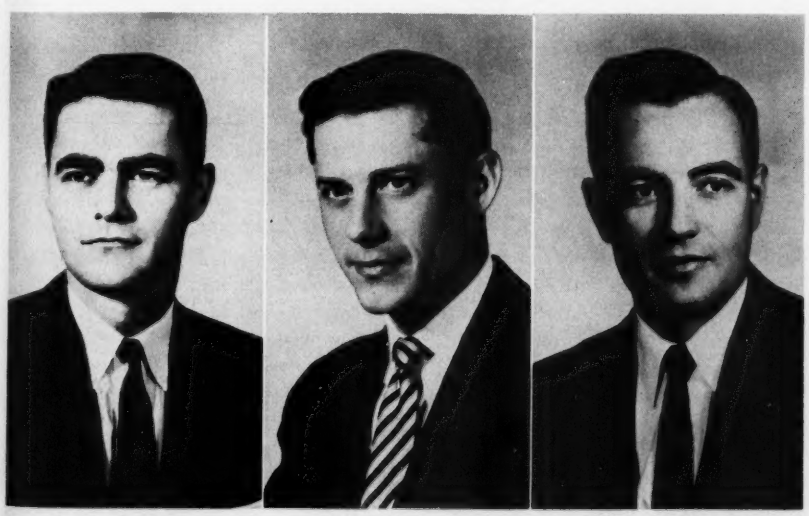
Burkett jointed Chiksan after having sold his interest in Waterwear Company, a Newport Beach, Calif., firm which manufacturers diving equipment. His capacity at Waterwear Company as sales manager was preceded by five years' experience in the sales force of Albers Milling Company. Burkett, a Navy veteran, is an industrial management graduate from the University of Southern California. He makes his home at Newport Beach.

Illsley has been Chiksan production control supervisor since 1952 and has an intimate knowledge of Chiksan products. He served in the U. S. Air Force as management specialist and, like Burkett, is an industrial management graduate from U. S. C. He has the distinction of having twice been a member of the National AAU water polo championship team (1949-50) and was co-captain and All American in 1950. Illsley, a native of Fullerton, California, now lives in Yorba Linda.

Joe Beyer is a former Pan American Airways radio operator who later served as Airways Controller in Alaska for the Civil Aeronautics Administration. A two-war veteran of the Marine Corps, he has since been employed by International Business Machines in sales and service. He obtained his schooling at Menlo College and lives in San Francisco.

C. B. Gerow, mechanic foreman for General Petroleum's transportation department at Taft, has rounded out 25 years service with the Flying Pegasus organization. His service with the company has been entirely at Taft. He was the recipient of special commendation of company board of directors and a diamond emblem for his lapel.

New members of the American Association of Petroleum Landmen and representative of companies familiar to California, include L. Richard Girouard, Honolulu Oil Corporation, Billings, Montana; E. A. Backlund, Western Gulf Oil Corporation, Bakersfield; and Robert L. Faison and W. E. Thompson of Union Oil Company of California. Headquarters of the former are Aurora, Colorado; and of the latter, California.



Joseph P. Beyer | John E. Burkett | Edwin P. Illsley

Tyler Transferred To Netherlands

The appointment of F. L. Tyler as manager of Reed Roller Bit Company's European subsidiary, Reed Roller Bit Company (Netherlands) N. V., has been announced. Mr. Tyler was formerly Reed's Pacific Coast sales Division Manager in Los Angeles.

The new Reed plant is located at 436 Laan Van Meerdervoort, The Hague.

F. L. Tyler

Tyler has been associated with the Houston oil well drilling tool manufacturing firm since 1940. He is an engineering graduate of the Colorado School of Mines, and was engaged in the oil business both in this country and abroad for several years before his association with Reed. He is active in the American Petroleum Institute and in the Nomads.

Next June 2 has been set as the wedding date for beautiful Diane Frazier, daughter of Irvin Frazier, The Texas Company chief scout at Los Angeles. She is betrothed to Harold H. Hill of Piedmont. The engaged pair, both UC Berkeley alumni, will be married at Piedmont Community Church.

Prexy Bob Minckler of General Petroleum at Los Angeles is on a junket to all the most interesting spots in Europe and other places far from California. He plans to return to the City of the Angels by May 1.

Joint Report on Drilling Costs

A special study of drilling costs —the first ever compiled on an industry - wide basis — revealed that U. S. oil men and oil companies invested an average of $50,000 in each of the 49,279 wells drilled in this country in 1953.

The study also brought into sharp focus for the first time the astronomical way in which drilling costs skyrocket as the depth of the wells increases. It showed, for example, that while drilling costs per incremental foot in the 3,750 to 5,000-foot range averaged almost $13 in 1953, they ran close to $106 per foot beyond the 15,000-foot level.

Even more significant is the fact that costs for off-shore wells—the report contains cost figures on 82 drilled in the Louisiana offshore area —are considerably higher than land wells. The study disclosed that drilling costs in that area alone were almost six times more than the U. S. land average.

The special study, termed a "Joint Association Survey," was made by the American Petroleum Institute, the Independent Petroleum Association of America, and the Mid-Continent Oil & Gas Association. Undertaken because of the lack of authoritative information on the cost of drilling and equipping an oil well, it represents the first time that this data has been compiled and analyzed on a sound industry-wide basis.

The study is based on 1953 figures, the most recent ones available when it was initiated. Because this was a pioneering effort, the time required for completion proved longer than contemplated.

Officials of all three associations pointed out, however, that currently costs for drilling and equipping oil wells are undoubtedly considerably greater than those for 1953 which are covered in the survey. They noted that material, labor and other costs have consistently risen over the past two years, and emphasized that these would be reflected in higher figures were a 1955 survey also available, as would the need, and trend, for still costlier deeper drilling.

In addition, they said, the survey statistics show plainly why the capital requirements for finding and producing oil are so extensive, and why the industry as a whole, needs a continuing flow of free capital to press its search for more supplies for the future.

The Associations reported that the information contained in the 1953 survey covers only the costs incidental to the completion of wells for production through "Christmas Tree." They do not include the outlays necessary for flow lines, separators, tank batteries, etc., that are required to equip wells for production. Nor do they include any of the vast sums expended on preliminary exploratory work, such as seismograph and geophysical operations.

The survey showed that oil men and oil companies drilled 198 million, 839 thousand feet of hole in 1953, at a total cost of 2 billion, 471 million dollars. For the 49,279 wells involved, this averaged out to $50,-200 per well, or $12.43 per foot drilled.

These averages are only half the story, however. The survey showed that the average costs jump from $28,400 in the 2,501-3,750 foot depth range, to $43,000 for the 3,751-5,000 foot category. From there the averages go to $76,400 for the 5,001-7,500 foot level; $128,300 for 7,501-10,000 feet; $230,000 for 10,001-12,500 feet; $363,300 for the 12,501-15,000 feet, and to $644,000 for wells beyond the 15,000 foot level.

A thumbnail table of the cost picture follows:

Depth Range	Wells Drilled U. S.	Avg. Depth Well-Feet	Avg. Cost Per Ft. ($)	Cost of Incremental Increase in Depth Cost Per Added Ft.
0- 1,250	5,001	849	6.63	
1,251- 2,500	10,219	1,793	7.99	9.22
2,501- 3,750	12,603	3,121	9.10	10.62
3,751- 5,000	7,442	4,292	10.09	12.72
5,001- 7,500	8,624	6,104	12.51	18.27
7,501-10,000	3,496	8,631	14.86	20.54
10,001-12,500	1,414	11,083	20.83	41.80
12,501-15,000	447	13,380	27.15	57.68
Over 15,000	33	16,038	40.20	105.91
	49,279	4,035	12.43	

The cost figures for the 82 wells reported as drilled in the Louisiana off-shore area ranged from an average of $192,400 in the 7,501-10,000 foot depth classification, to $765,500 per average well in the 12,501-15,000 foot range. The average for these wells was reported in the survey as $298,800 each.

In connection with the off-shore data, the associations pointed out that in 1953 such wells were drilled in rather shallow water. Equipment permitting drilling in deeper water (and probably at higher costs) became operative only after 1953.

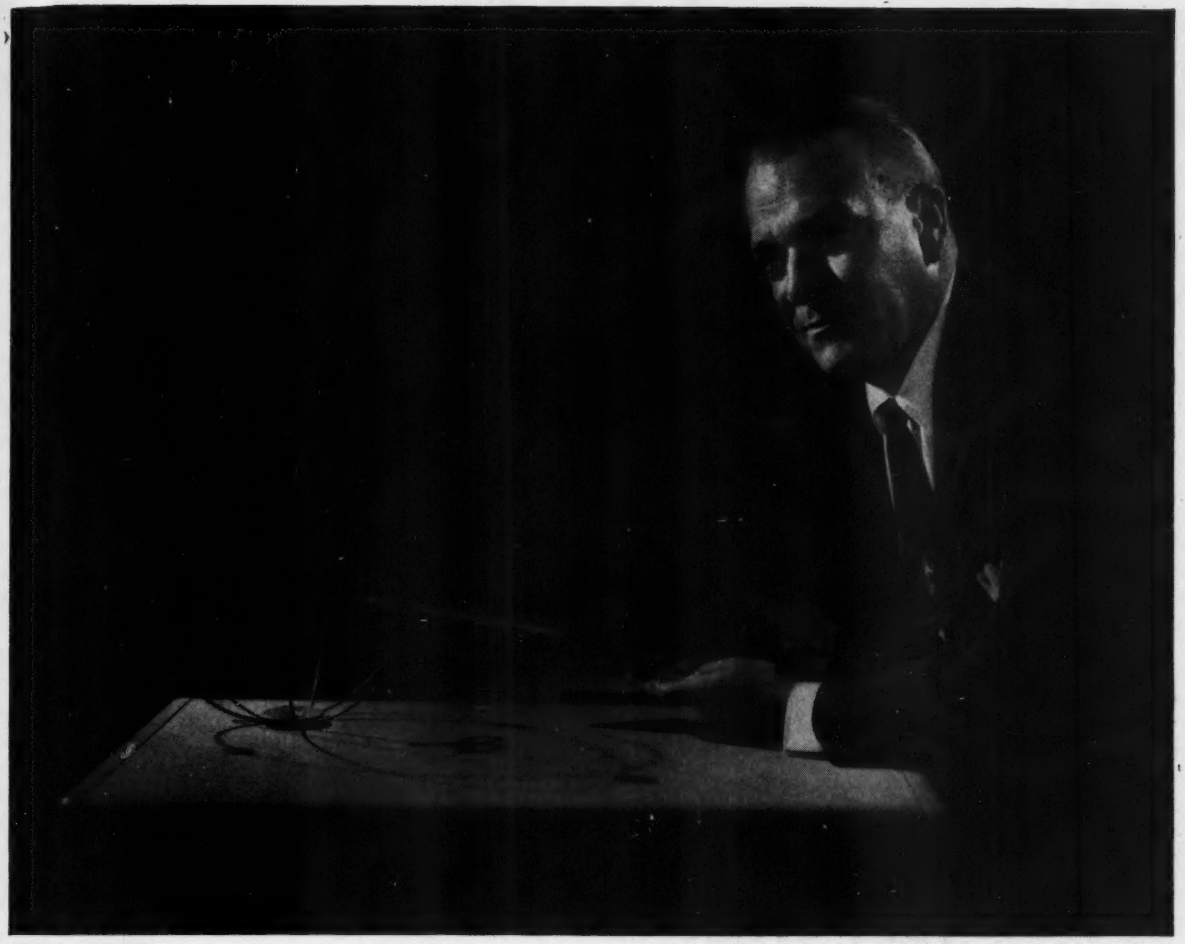
Supplemental tables in the survey showed that drilling costs for average wells in at least five states exceeded $100,000. These were Florida, $111,000; North Dakota, $100,-500; Louisiana (including off-shore), $120,000; New Mexico, $100,500; and Utah, $163,700.

The report by districts provided this picture:

District I (Florida, New York, Pennsylvania, West Virginia), 2,851 wells at an average cost of $15,000 each; District II (Illinois, Indiana, Kansas, Kentucky, Michigan, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota), 19,298 wells at an average cost of $29,500 each; District III (Alabama, Arkansas, Louisiana (including off-shore), Mississippi, New Mexico, Texas), 22,-322 wells at an average cost of $66,500 each; District IV (Colorado, Montana, Utah, Wyoming), 2,142 wells at an average cost of $71,800 each; District V (California), 2,578 wells at an average cost of $85,700 each; miscellaneous: 88 wells at an average cost of $14,200 each.

She—"Aren't these new freeways simply wonderful?"

He—"I'll say they are. The old narrow highways where two cars could hardly pass are being replaced by wide expressways where six or eight cars can collide at one time."



JOHN S. COLEMAN

Portrait by Fabian Bachrach

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"I am proud that 80% of Burroughs employees are enrolled in systematic savings in U. S. Savings Bonds through the Payroll Savings Plan. The record of the response of our men and women to our recent campaign speaks for itself. It is evidence of the desire to save, and to save in a way which benefits both the individual and the nation. I hope that every employer will take advantage of this opportunity to serve the interest of both his employees and the country by cooperating with the Department of the Treasury in the U. S. Savings Bonds campaign."

JOHN S. COLEMAN, ***President***
Burroughs Corporation

What is the percentage of employee participation in *your* Payroll Savings Plan?* If it is less than 50%, your State Sales Director will be glad to show you how easy it is to raise participation to 60% or higher. He will furnish Payroll Savings Application Blanks, and all the printed promotional material you can use. Write today to Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

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LAUGH THIS OFF!!

A little mink died and went to heaven where St. Peter met him at the gate.

"You were a good little mink on earth," said St. Peter, "so we'll give you anything you like. What do you want most?"

"Well," said the little mink, "I think I'd like a coat made of chorus girls."

Each day for a week the accountant had been arriving at the office looking more and more haggard. Finally, his boss asked him what was the trouble.

"Well," said the hollow-eyed man, "my mother-in-law gave Junior a drum for his birthday . . . and he's up every morning at five o'clock pounding on it. My wife won't let me take it away from him and I don't know what to do."

"Hmmmm!" the boss mused. "That shouldn't be too difficult. Suppose you buy Junior a jack-knife . . . and ask him if he knows what's inside the drum."

A good memory test: What were you worrying about one year ago today?

The young married couple were having their first breakfast together in the hotel restaurant. When the shapely waitress brought the menu, she said, "Good morning, honey," to the groom.

Silence reigned until she left, then the bride blew up.

"Who is she?"

"Calm down darling," pleaded the groom. "I'm going to have enough trouble explaining you to her!"

Coed—"The boy I went riding with last night saw dark spots in front of his eyes."

Roommate—"What did he do?"

Coed—"Parked in one of them."

Three little boys were boasting about their fathers, when the conversation turned to earning capacity. One was the son of a doctor, another the son of a lawyer, and the third the son of a minister.

"My father makes money fast," said the first little boy. "He just goes to the hospital, performs an operation, and sometimes gets $500."

"My father," said the second, "does better than that. All he has to do is go to the courtroom and talk for about a day and he charges his client a thousand dollars."

The minister's boy, however, topped them all. "My dad," he said, "Does practically nothing all week, then talks about 20 minutes on Sunday morning, and it takes four men to bring the money to him."

Two slightly daft people were playing a little game. "What have I got here?" asked one with his hands cupped.

"Three navy patrol bombers."

"Nope."

"The Philadelphia Symphony Orchestra?"

The first looked into his hands again and said slyly: "Who's conducting?"

Daughter—"Can't we ever teach father to say 'fertilizer' instead of talking about 'manure' all the time?"

Mother—"Better let well enough alone. Remember how long it took us to get him to say, 'manure'?"

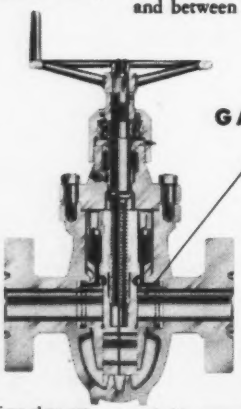
Irritated Motorist (who had just been side-swiped by a character driving a big black Cadillac)—"What's the matter, Mac, did you have to hock your brains as a down payment?"

If your wife wants to learn to drive don't stand in her way.

STOPS LEAKS THE INSTANT THEY START!

The McEvoy Automatic *Self-Sealing* Gate Valve actually stops leaks as they start.

Because all McEvoy Valves are *"GASKETED"* between the gate and seat and between seat and body.



Tightness is *built into* McEvoy Valves under all conditions because the moving metal surfaces of gate and seat (which are under the same pressure as the flanges) are automatically and instantly "gasketed" . . . each time they are operated.

A simple system of reservoir, passageway and seat groove is so arranged that *sealing compound* (Not lubricant) is automatically injected between the faces of seat and gate after *each* closing of the valve. This compound forms a leak-proof "gasket" at the metal areas so that *leakage cannot exist*, regardless of pressure, load of gate on seat, dirt or contaminants, etc.

This simple, but all-important sealing system is the "guts" of the McEvoy Valve. Proof of the success of this system lies in the thousands of McEvoy Valves that have been installed round-the-world under all imaginable pressures and conditions.

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McCullough® REPORTS TO THE OIL INDUSTRY

Service
Anywhere Anytime

New Services • • • New Tools • • • New Methods • • • Outstanding Results

M-3 Guns Shoot 641 Burrless Bullets in High Angle Well for 151 B/D

This California well had previously been perforated by another service company without results.

Casing was 7" O.D. N-80 cemented in a 12¼" 65° hole. Depth of perforating operation was below 6900'.

4¾" O.D. McCullough M-3 Bullet Perforators fired 641 improved ½" Burrless Bullets in the pay zone for 151 barrels per day of clean oil.

In spite of the high angle of the hole the job was completed without difficulty of any type—a tribute to the efficiency and versatility of McCullough's Perforating Service and the skill of their gun crews.

M-3 Gun Brings in Best Well in Field

Deep Penetrating McCullough M-3 Gun Perforates for 1084 B/D, Cuts Costly Rig Time to Minimum

Deep penetrating power, accuracy and exceptional speed combined to give this New Mexico operator a highly profitable completion.

This was a development well in a proven field. 5½" O.D. 14 lb. casing had been set to total depth.

McCullough logged from 2600' to 3037', obtaining Gamma Ray and Neutron curves and recording a simultaneous collar log. Pay zone was located between 3012' and 3022'. The 10' zone was perforated by a 3½" O.D. McCullough M-3 Bullet Perforator firing 60 improved ½" Ogival Bullets, six per foot. Casing was loaded with oil at the perforating interval.

On production tests the well flowed 1084 barrels of oil per day without fracturing or acidizing—the best well in the field.

By perforating from the accurate measurements of the McCullough Radiation Well Logger, the entire pay zone was uniformly covered by an exact pattern of shots from the M-3 Gun. Since the M-3 fires all shots at one time, the hole pattern in the casing is the same as the chambers in the gun.

Rig time on this job was slashed to a minimum. Only one hour and five minutes was required to complete both logging and perforating—an important saving to the operator.

Speed like this can only be accomplished by experienced, thoroughly trained service crews and by using simultaneous firing M-3 Bullet Guns —fastest, most efficient method of bullet perforating available.

Simultaneous firing of M-3 Guns assures uniform hole pattern in casing.

The perforation pattern in the casing is the same as the chambers of the M-3 Gun itself. Shots are placed in patterns of staggered rows. This permits the safe use of more holes per foot in the casing, assures complete, uniform coverage of the productive zone, provides maximum drainage area and eliminates the possibility of bunching all shots in one area in the casing.

McCullough® *TOOL COMPANY*

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LOS ANGELES
HOUSTON
EDMONTON

Want to move a bridge?

...call MACCO

A. Teichert & Son, Inc., and M. J. Bevanda, joint venturers for improving the Los Angeles River, were faced with the problem of having to build a new detour bridge or utilize the existing structure to provide a downstream detour during the building of a new reinforced concrete bridge over the old site at the Compton Boulevard crossing. Macco was called in, and by utilizing jacks and rollers and a unique engineering plan, they were able to move six spans of the existing steel and timber bridge (378 ft. long and weighing 600 tons) thus saving the prohibitive cost of a new temporary bridge. The old structure was moved intact, piers and all, 90 feet downstream on the east end, and 160 feet on the west end which increased the skew by 10% with no damage to the bridge asphalt pavement. The entire job was completed in 41 working days—another example of Macco versatility and engineering skill.

Closeup of Macco piledriver driving 37½-ft. "Spunpile" concrete pilings which will serve as foundations for the new bridge. This work was done during the moving operation.

PHONE **NEVADA 6-1261**

CONSTRUCTION DIVISION MACCO **MACCO CORPORATION**

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